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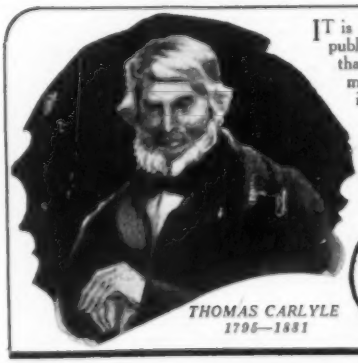

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Male Gonorrhœa treated with Sulphapyridine.
Major SYDNEY M. LAIRD, F.R.F.P.S. 463

Blood Concentrations during Chemotherapy of Gonorrhœa.
Major R. W. FAIRBROTHER, F.R.C.P., Captain C. A. AYMER, M.B., C. W. ASHTON (*charts*) 464

Peptic Ulceration: Results of Modern Treatment.
Major B. M. NICOL, M.B. 466

Aspiration of Petrol.
CUTHBERT LESLIE COPE, F.R.C.P. 469

Staphylococcal Septicæmia: Two Cases treated with Sulphathiazole.
W. S. FLOWERS, M.B., D. H. COLLINS, M.D., K. H. HARDY, M.B. 470

Salt Concentration in Blood-grouping Technique.
Prof. HANS SACHS, M.D. 473

Prevention of Hammer-toe Bursitis.
KENNETH McFADYEAN, M.R.C.S. 474

Control of Rickettsias: Immunisation against Infection.
Living Murine Typhus Vaccine — Killed Exanthematic Typhus Vaccine.
G. W. M. FINDLAY, C.B.E., SC.D. 483

LEADING ARTICLES

VITAMIN A IN VEGETABLES 477
COMMISSION AND OMISSION 477
THERAPY OF GONOCOCCAL INFECTION 478

ANNOTATIONS

The Balance of Sex 479
Prognosis in Staphylococcal Septicæmia 480
Food to Work on 480
Third Supplement to the BPC 481
Doubts on Vitamin K for the Newborn 481
Blood in the Stools 482
Surgery at Pearl Harbour .. 482

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE: Section of Surgery: First Principles of Wound Treatment .. 474

REVIEWS OF BOOKS

Handbook of Communicable Diseases. Franklin H. Top, M.D. 476
A Modern Approach to Health Education 476
Law for the Medical Practitioner. D. H. Kitchin. 476

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 485

SPECIAL ARTICLES

Scotland: Four Terms a Year — Toxæmias of Pregnancy — A Secure Place of Refuge 484
Infectious Disease in England and Wales 492

LETTERS TO THE EDITOR

Medical Women with the Forces (Dr. Clara Stewart) 487
Vitamin C in Transported Meals (Dr. E. H. M. Milligan) 487
Diagnosis of Pernicious Anæmia (Dr. M. C. G. Israëls) 487
Migraine Relieved with a Hormone (Dr. Nevil Leyton) 488
RCS Council Election (Mr. Eric Crook and others) .. 488
Relief of Famine (Dr. Jean Bell and others) 488
Jaundiced Children (Dr. D. Ockman) 489
Hospital's Liability for Negligence of Staff (Mr. C. E. A. Bedwell) 489
Dosage of Insulin (Dr. S. L. Simpson) 489
Zinc Peroxide (Dr. W. R. Thrower) 489
Students' Call-up 489
"Rat Virus" (Mr. Thomas McLachlan, F.I.C.) 489

Appointments — Births, Marriages and Deaths .. 492

OBITUARY

George McNeill, F.R.C.S.E. . 490
David Henriques de Souza, F.R.C.P. 490
Robert Brown Campbell, F.R.C.P.E. 490
Wacław Stocki, M.D. 490

MEDICAL NEWS

Royal College of Surgeons of England 491
University of London 491
University of Dublin 491
Conference on the Health of the Worker 491
Czech Medical 491
Royal Society of Medicine 492
Harveian Society of London 491
Medical Society for the Study of Venereal Diseases 491
Royal Sanitary Institute .. 491
Medical Planning at Sheffield 491
Imperial Cancer Research Fund 491
Imperial Chemical (Pharmaceuticals Ltd.) 491
Medical Casualties 491
Society for Relief of Widows and Orphans of Medical Men 491
Heberden Medal 464
Sheffield Radium Centre ... 466

NOTICES

Students' Board and Lodging 492
A Dietetic Ready Reckoner 492
Microscopes for Russian Vets 492

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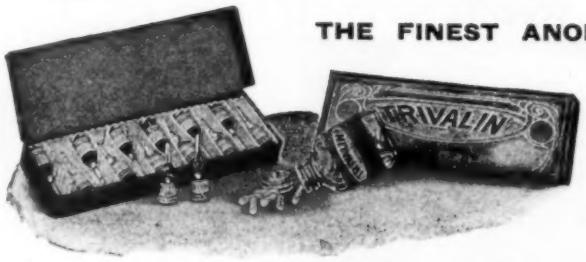

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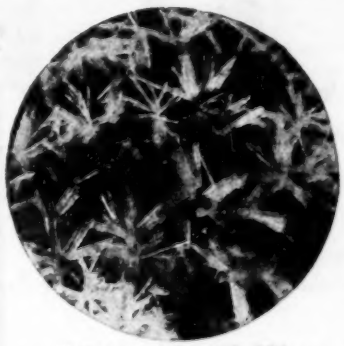

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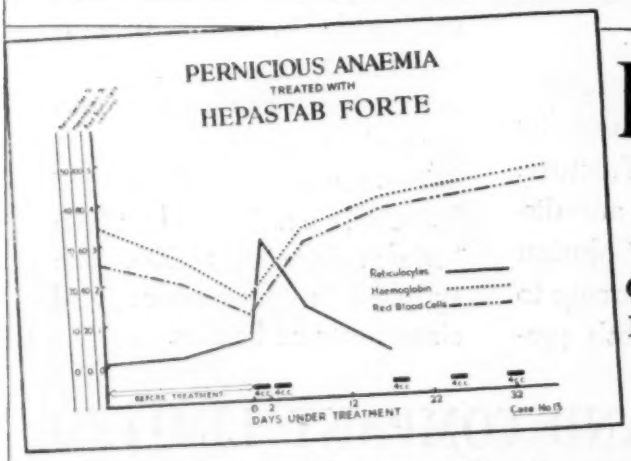

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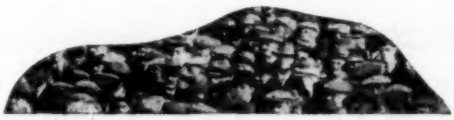

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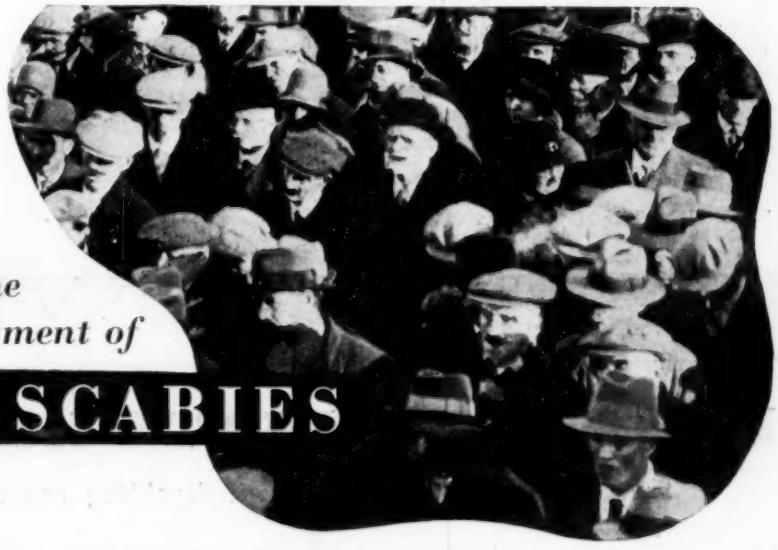

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12

MALE GONORRHŒA TREATED WITH SULPHAPYRIDINE

SYDNEY M. LAIRD, M.D. GLASG., F.R.F.P.S., D.P.H.
MAJOR R.A.M.C.
VENEREAL DISEASES OFFICER AT A SPECIAL TREATMENT CENTRE

THIS paper reports an attempt to determine a standard course of treatment most suitable for the inpatient therapy of gonorrhœa in Service patients. Such a course must satisfy certain basic requirements—namely, rapid clinical cure, the avoidance of serious toxic effects, a low rate of complications and relapse, and the early discharge from hospital of a man fit for the full duties of active service. Since some of these considerations also apply to civil practice, particularly to patients engaged on war work, the findings of the investigation here reported may be of general interest. No attempt is made to refer to the published work on the chemotherapy of male gonorrhœa, in which few contributions make any real attempt to outline an optimum course of treatment.

MANAGEMENT OF CASES

The clinical material comprises 764 cases of acute gonococcal anterior urethritis. All patients were Service men, the vast majority being otherwise physically fit and between 18 and 30 years of age. All cases were treated in hospital and every patient was examined personally each day. Accurate observation and standardised recording can therefore be claimed. When severe vomiting complicated chemotherapy the patient was permitted to be in bed, otherwise all patients were up and did fatigues during the morning and afternoon. The daily inspection took place 3 hours after the voiding of the first morning specimen of urine and before urethral lavage.

Lavage was carried out under supervision twice daily, and consisted of posterior irrigation with a 1/8000 solution of potassium permanganate at 105° F. Sulphapyridine tablets were swallowed whole or crushed according to the patient's taste and washed down with water. This procedure was also supervised to ensure that the prescribed tablets were taken. The dosage of sulphapyridine and the fluid intake used in various groups of cases are detailed later.

Chemotherapy was begun on the day of admission, while urethral lavage, if prescribed, started next day. Clinical cure was recorded on the first morning on which the patient was free from urethral discharge and presented a urine free from pus and shreds. As soon as the course of sulphapyridine was completed and clinical cure had been recorded the patient received his first test of cure. This entailed the passage of a metal bougie into the bladder; massage of the anterior urethra over the bougie; palpation and massage of the prostate, vesicles and glands of Cowper; and microscopic examination of the expressed secretions. If the patient presented a normal urine and no urethral discharge on the morning after this examination, arrangements were completed for his discharge from hospital next day. In computing the average number of days in hospital the day of admission and discharge are included as whole days.

After his discharge from hospital the patient is supervised as follows: three examinations are made, including prostatic smear, at weekly intervals; final tests follow three months after discharge from hospital. Supervision may be carried out in different centres but the minimum final test which is accepted demands the absence of urethral discharge, a normal urine, passage of a metal bougie to the bladder, massage of the anterior urethra over the metal bougie, palpation and massage of the prostate, vesicles and glands of Cowper, microscopic examination of the expressed secretion and a blood test to exclude syphilis. In many centres the final test may also include anterior urethroscopy, examination of the deposit obtained by centrifuging the first morning specimen of urine, provocation by vaccine and the gonococcal complement-fixation test.

The routine use of cultural methods, unfortunately, is exceptional. When the reports are unsatisfactory the patient is readmitted to the Service VD hospital. In the present investigation a case was regarded as a failure in any of the following circumstances; where clinical cure was not established within 10 days of the start of chemotherapy; where any prostatic smear was abnormal; where relapse occurred; where any abnormality was detected in the urethra or its communicating glands; and in any case developing complications during or following treatment. The considerable number of cases which, although classified as failures for the purposes of this study, completed the supervised tests without further treatment testifies to the stringency of the standard adopted. For various reasons it has proved impossible to follow up all the patients of this series and a record of the satisfactory completion of final tests of cure is not available in every case; but there is good reason to suppose that information has been received concerning nearly all cases in which subsequent reports were unsatisfactory.

TREATMENT AND RESULTS

Six separate schemes of treatment have been used.

Series A.—1 g. sulphapyridine was given at 8 A.M., 12 noon, 4 P.M. and 8 P.M. daily for 6 days (24 g.); the daily fluid intake was 7 pints and urethral irrigation was used.

Series B.—The same as A except that irrigation was omitted.

Series C.—The same as B, but the fluid intake was restricted to 3 pints daily.

Series D.—Sulphapyridine, 1 g., was given 4-hourly for 4 days (24 g.) without irrigation and the fluid intake was 3 pints daily.

Series E.—The sulphapyridine dosage was the same as in D but irrigation was used and the fluid intake was 7 pints daily.

Series F.—The same as E but sulphapyridine was stopped after 3 days (18 g.).

Except as indicated above all circumstances in these six groups were comparable. Results are presented in the accompanying table.

RESULTS FROM SIX DIFFERENT SCHEMES OF TREATMENT

Series	Sulphapyridine (g. daily)*	Fluid intake (pints daily)	Irrigations	Total cases	Cures (%)	Failures (%)	Average days for clinical cure	Average days in hospital	Early relapse (%)	Late relapse (%)	Further treatment needed (%)	Complications during chemotherapy %	Complications after chemotherapy %	Microscopic prostatitis (%)	Vomiting (%)	Hæmaturia (%)
A	4 (6)	7	Yes	163	84	16	4	9	2	4	27	2	0·6	9	8·5	0
B	4 (6)	7	No	102	84	16	4·3	8·6	6	5	30	0	1	4	9·5	0
C	4 (6)	3	No	86	84	16	5·3	8·5	2	1	71	5	1	5	12·5	1
D	6 (4)	3	No	112	81	19	4·7	7·4	5	3	75	0	0	4·5	13	2
E	6 (4)	7	Yes	230	91	9	4·4	7·1	2	1	37·5	0·4	0·4	6	8	0·3
F	6 (3)	7	Yes	71	84·5	15·5	5	7·3	0	3	57	0	0	11	13	3

* Number of days in parentheses.

DISCUSSION

The rates for cure and failure were remarkably constant in 5 groups, and the cure-rate in series E was slightly higher than the general level. The average time required for clinical cure varied between 4 and 5·3 days. Of the 5 groups in which sulphapyridine dosage totalled 24 g. the time of cure was longest in groups C and D, where irrigation was withheld and fluid intake was restricted. Comparison of the results in series A and B, in which dosage and fluid intake were similar, reveals that irrigated cases achieved clinical cure sooner than those treated without urethral lavage. The average time in hospital was influenced largely by the duration of the course of chemotherapy. Cases of relapse have been divided into late and early relapse, as described in a previous paper.[1] Early cases relapse soon after the completion of chemotherapy while late cases may relapse several weeks or months after treatment and initial tests of cure. The incidence of early relapse was small in all groups but was lowest in those patients receiving irrigation, a high fluid intake and sulphapyridine 4-hourly (series E and F). The incidence of late relapse was satisfactory, being lowest in series E.

From a study of the percentage of failures in which further treatment was necessary to obtain cure, it appears that a low fluid intake is unfavourable and that a total of 18 g. of sulphapyridine is less satisfactory than 24 g. Complications arising during chemotherapy were insignificant except in series C where the fluid intake was low. They were: inflammation of Tyson's glands; periurethral abscess, and 1 case (in series A) with periurethral abscess, conjunctivitis and tenosynovitis; 2 cases each of acute posterior urethritis and acute tenosynovitis in series C; and 1 case of synovitis in series E.

The high incidence of acute posterior urethritis in group C—in which irrigation and a high fluid intake were lacking—is of interest. Acute complications developing after chemotherapy were rare and comprised: 1 case of periurethral abscess (series A); 1 case of inflammation of Tyson's glands (series C); and 2 cases of acute tenosynovitis (series B and E). Microscopic prostatitis was diagnosed in all 6 groups after chemotherapy but was more common in those patients receiving urethral lavage. In addition, some cases were found during the initial test to have chronic structural changes indicative of previous infection (e.g., stricture, palpable glands of Cowper, and abnormal shape, size or consistency of the prostate and vesicles). Vomiting and hæmaturia occurred as shown in the table and were the only troublesome toxic manifestations. Vomiting is the great bugbear of heavy sulphapyridine dosage, since it may lead to dehydration and the onset of hæmaturia. The cause, treatment and prevention of the latter have been described elsewhere.[2] The need for a high fluid intake in cases receiving chemotherapy must again be emphasised.

SUMMARY

A suitable course of inpatient treatment for acute anterior gonococcal urethritis in Service men is described.

Six schemes of treatment employed in the total series of 704 cases are set out.

The best results followed 4-hourly doses of 1 g. of sulphapyridine over a period of 4 days.

Urethral lavage and a high fluid intake were of benefit in reducing the number of failures, the time necessary for clinical cure, the rate of early relapse, and the incidence of acute complications during and following chemotherapy.

I wish to thank the officer commanding this military hospital for permission to publish the results.

1. *Brit. med. J.* 1940, i, 967. 2. *Lancet*, 1941, ii, 272.

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BLOOD CONCENTRATIONS DURING CHEMOTHERAPY OF GONORRHŒA

R. W. FAIRBROTHER, M.D., D.SC. MANC., F.R.C.P., MAJOR R.A.M.C.
C. A. AYMER, M.B. ABERD., CAPTAIN R.A.M.C.
C. W. ASHTON, SENIOR TECHNICIAN
(From a Military Hospital)

THERE is general agreement that the sulphonamide compounds, particularly sulphapyridine, are highly successful in the treatment of acute gonococcal infections. There does not, however, seem to be general agreement on the question of dosage for routine application. Some workers (e.g. Prebble 1940, Taylor 1940, Sommerville 1941) have obtained satisfactory results with relatively small doses given for long periods, such as 25–30 g. in 10–14 days. Recently there has been a tendency to adopt more intensive courses; King and Williams (1941) have given 23 g. in 72 hours, while MacKenna (1941) has advocated even more concentrated dosage—22 g. in 48 hours. In these intensive methods emphasis is given to the importance of initial massive doses followed by smaller doses at regular 4-hourly intervals throughout the day and night. It is noteworthy that, with all these schemes, a small percentage of cases have almost invariably failed to respond to treatment: they have proved sulphonamide-resistant.

In view of these discrepancies we decided to determine, in a consecutive series of proved cases of acute gonorrhœa, the concentration of sulphapyridine in the blood after various schemes of dosage and to correlate these findings with the clinical results.

TECHNIQUE

The diagnosis was established in all cases before treatment began by demonstration of the gonococcus in urethral smears.

Routine dosage.—The routine course of sulphapyridine was that recommended by MacKenna (1941), 22 g. being administered in 48 hours at 4-hourly intervals during the day and night.

The first four doses were successively 5, 4, 3 and 2 g. and the remaining eight doses were each 1 g. The tablets were crushed and given with a little water. During this period the patients were kept in bed under close observation, denied food and given a large amount of water to drink (a minimum of 10–12 pints in 24 hours); smoking was prohibited and any tendency to constipation was corrected. Sodium citrate, gr. 30, was given 2 hours after the tablets, because the tendency to nausea was accentuated when this was taken with, or immediately after, the tablets; this practice was not strictly enforced however.

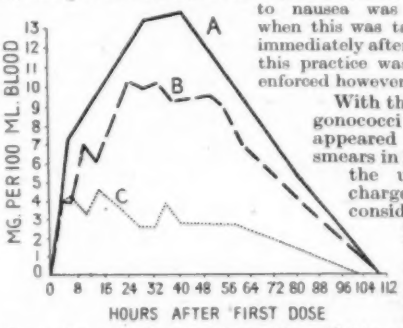

FIG. 1—Concentration of sulphapyridine with intensive dosage. A, case with highest values. B, average levels of 18 cases. C, case with lowest values.

With this treatment gonococci usually disappeared from the smears in 24 hours and the urethral discharge decreased considerably in a few days. When the discharge persisted, irrigations with 1/10,000 potassium permanganate were instituted. In most of the resistant cases the reduction in the number of gonococci seen in urethral smears was temporary, lasting a few days only.

Tests for cure.—Evaluation of cure in cases of gonorrhœa is difficult and it is necessary to carry out a comprehensive series of tests in order to exclude the presence of residual infection. Complement-fixation tests, advocated by some workers, were not done, since the results are often valueless, but the following tests were used.

1. Urethral smears, obtained before the morning specimen of urine was passed, were examined daily, in particular for pus cells or gonococci.

2. Two-glass test. The bladder not having been emptied for at least 6 hours, the morning sample of urine was passed into two glasses and examined macroscopically, mainly for the presence of threads. If on 2 consecutive days the urine was clear and urethral smears could not be obtained, more searching tests for cure were carried out.

3. Examination of prostate, vesicles and smear of prostatic exudate. If this was satisfactory and remained so for 2 days, further tests were made.

4. Anterior urethroscopy.

5. Four-glass test and examination of prostatic smear.

If these tests proved satisfactory, the patient was kept under observation for a further 2 days and then discharged to his unit. The minimum time in which a patient could be discharged was consequently 9 days. At the end of 3 months all cases reported for their final tests for cure.

Estimation of blood concentrations.—A modification of the method introduced by Werner (1939) was used. The reliability of this method has been confirmed for the estimation of free sulphapyridine when more than 2 mg. per ml. are present (Andrews and Strauss 1941). Morris (1941), however, considered that it was unsatisfactory for the estimation of the acetylated product; he criticised the method because the precipitation of the blood proteins was not satisfactory and the results were subject to variation from pH fluctuations. In order to overcome these objections the following technique has been used in this investigation:

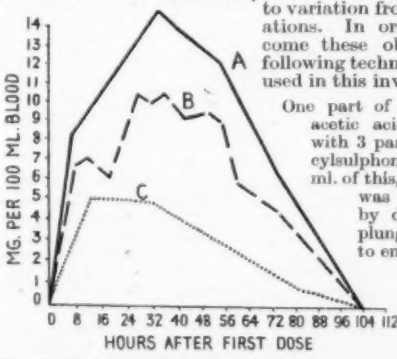

FIG. 2—Concentration of sulphapyridine with modified dosage. A, highest case. B, mean of 21 cases. C, lowest case.

One part of 20% trichloracetic acid was mixed with 3 parts of 3% salicylsulphonic acid; to 9 ml. of this, 1 ml. of blood was added, drop by drop; a glass plunger was used to ensure thorough mixing, and the tube was inverted about five times. The mixture was centrifuged for 10 min. To 4 ml. of the supernatant fluid were then added to 2·5 ml. of disodium hydrogen citrate and 1 ml. of 3% dimethylaminobenzaldehyde. In the presence of free sulphapyridine a yellow colour was produced which was immediately maximal and stable. Comparison was made in a colorimeter with standard 5% and 10% solutions of pure sulphapyridine, which had been subjected to an identical form of treatment.

BLOOD CONCENTRATIONS OF FREE SULPHAPYRIDINE

1. *Routine course.*—Samples of blood were collected at different stages during the intensive course; in some cases as many as 13 samples were taken, the first ½ hr. before the drug was administered and the others at regular intervals (usually 4 or 8 hours) for several days. Estimations of the blood concentration were made by a modification of the Werner technique. In the early stages both free sulphapyridine and the acetylated product were estimated, but since the method for the estimation of acetylated sulphapyridine has been criticised and since this product is ineffective as an antibacterial factor, its estimation was abandoned. In all, 125 estimations have been carried out on 18 patients. The average results are given in fig. 1, together with curves of the cases giving the highest and lowest values. There was considerable individual irregularity in the degree of absorption, as evidenced by the differences shown in these curves. As a general rule absorption was rapid and tended to reach a maximum in 32–36 hours; in most cases blood concentrations of 8 mg. per 100 ml. or over were maintained for 36–44 hours. After the administration of the drug had ceased the high levels were maintained as a rule for some 8 hours, after which the concentrations fell quickly, though elimination was not complete for 56 hours. It is noteworthy that the patient giving curve C made a good recovery and was discharged from hospital in 17 days.

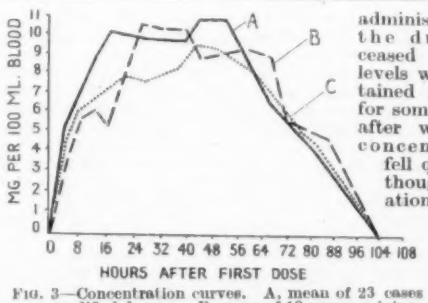

FIG. 3—Concentration curves. A, mean of 23 cases on modified dosage. B, mean of 19 cases on intensive dosage. C, mean of 6 resistant cases.

2. *Modified dosage.*—Some cases with high blood concentrations did not respond well clinically, while others with low blood levels cleared up rapidly. In a series of cases the dosage of sulphapyridine was therefore reduced; 18 g., instead of 22 g., was given in 48 hours, the first two doses being 3 g., the third and fourth 2 g. and the remainder 1 g. In this group of cases, 115 estimations were made on 21 patients. The average results are given in fig. 2, together with those of the cases giving the highest and lowest values. There was much individual variation in the levels obtained but the results were mostly in close agreement with those given by the routine course. In the majority of cases a concentration of 8 mg. or over was maintained for 36–44 hours. The highest reading obtained was 14·8 mg. per 100 ml.; with the routine course this was 14 mg.

BLOOD CONCENTRATION CORRELATED WITH CLINICAL RESULTS

Patients were divided into two groups, one receiving the routine course of 22 g. and the other the modified dosage of 18 g. The number of cases investigated was not large but the results confirm the biochemical observations in that there was little difference in the effects of the two courses (see table). In both groups the results were satisfactory and showed a slight improvement on those achieved in earlier courses (Jones and Fairbrother 1941).

DAY OF DISCHARGE FROM HOSPITAL AFTER TREATMENT

Treatment	No. of cases	Days in hospital		
		<15	15–21	>21
Intensive course	88	35 (40%)	37 (42%)	16 (18%)
Modified course	52	24 (46%)	20 (39%)	8 (15%)

Refractory cases.—A small percentage of cases do not respond well to chemotherapy and these are considered to be sulphonamide-resistant. It has been suggested that, in these cases, absorption of the drug is incomplete and an effective level in the blood is consequently not obtained. During this investigation 6 such refractory cases were under observation. In only 1 case was absorption poor; in the other 5 high levels were maintained for some time. The curve of the average levels together with those of the averages given by all cases on the intensive and modified courses is shown in fig. 3. The curves are similar and indicate that the ineffectiveness of sulphapyridine in the refractory cases was not due to failure of absorption. It is interesting that in all these cases the infection had spread from the anterior urethra and involved the posterior urethra and prostate.

DISCUSSION

Intensive dosage with sulphapyridine in cases of acute gonorrhœa usually produces a high concentration of the free drug in the blood which is maintained from 36–48 hours. High blood concentrations can also be produced by smaller doses of the drug than those advocated. The results, biochemical and clinical, obtained by the administration of 22 g. in 48 hours were closely analogous to those given by a dosage of 18 g. in the same time.

There are, moreover, indications that even the smaller dosage is too great, as several cases with concentration curves, appreciably lower than the average, showed excellent clinical results. This is not altogether surprising since it has already been demonstrated that greater absorption does not necessarily result from increased dosage with sulphapyridine (Long and Feinstone 1938). High concentrations of sulphapyridine may not be essential for the inhibition of the gonococcus, which is a delicate organism, difficult to culture and maintain under artificial conditions. Experiences with other infections have demonstrated that there is no strict correlation between rapidity of cure and the blood-level. Hobson and MacQuaide (1938) reported that, in cases of meningococcal meningitis, a concentration of 3 mg. per 100 ml. in the cerebrospinal fluid was sufficient to inhibit the organism; Flippin and his co-workers (1939) found that, in cases of pneumonia, patients with blood concentrations of 1–2·8 mg. per 100 ml. did as well as those with much higher levels.

In the chemotherapy of acute gonorrhœa dosage has usually been determined on empirical grounds. There is a big difference between the intensive courses and the earlier methods, in which a dose of 1 g. three times a day was common; with all schemes good results have been obtained. The main advantage of intensive therapy is probably the regular dosage at 4-hourly intervals, since it is generally accepted that regular dosage is necessary to maintain a persistently high level of blood concentration. The optimal effective level for cases of acute gonorrhœa has not yet been determined but the results of this investigation indicate that the large initial doses of the intensive course are unnecessary. Harrison (1941) has already suggested that much of the drug given in the intensive schemes might possibly be wasted, since several continental workers have claimed excellent results from small dosage given over short periods; in one small series a single dose proved successful.

The failure of certain cases to respond to treatment is not altogether surprising since acute gonorrhœa is a purulent infection often involving the posterior urethra and prostate, where the formation of minute abscesses is not uncommon. The results given above indicate that lack of absorption of sulphapyridine was not responsible for the failure to cure the resistant cases. It should not, however, be assumed that in these cases the gonococcus had become sulphonamide-resistant, since the organisms were probably protected from the action of the sulphapyridine by the purulent exudate. Under such conditions it is generally agreed that the action of the sulphonamides is greatly impaired.

SUMMARY

Intensive dosage with sulphapyridine has given satisfactory results in the treatment of acute gonorrhœa. Clinical and biochemical observations, however, indicate that the initial massive doses given in the course are unnecessary. Cases proving resistant to sulphonamide therapy were found to give levels of blood concentration comparable with those of successfully treated cases.

We wish to thank Corporal Lawrence and Corporal Turnbull for their assistance during this investigation.

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SHEFFIELD RADIUM CENTRE.—A gift of £100,000 from Alderman J. G. Graves, an ex-lord mayor of Sheffield, will turn the present centre with headquarters at the Royal Infirmary into a self-contained special hospital after the war. The work now being done in several different hospitals will thus be brought under one roof where the best modern equipment will be available. Patients come to the centre for radium treatment from South Yorkshire, and the adjoining counties of Derby, Lincoln and Notts.

PEPTIC ULCERATION

RESULTS OF MODERN TREATMENT

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AN attempt to reduce the concentration of free hydrochloric acid in the gastric contents has been the chief aim of medical treatment for peptic ulceration for over fifty years. Well-known diets of various composition, given as small feeds at frequent intervals, and designed to combine with free hydrochloric acid, have been used since the end of the nineteenth century (Leube 1876, Lenhartz 1904, Sippy 1915, Hurst 1920). Alkalis and antacids have been employed to neutralise acid, and the belladonna group of drugs and olive and almond oils to inhibit its secretion. Surgeons have devised methods to by-pass acid away from the ulcerated areas, and to allow the alkaline secretions of the duodenum, the pancreas and the liver to mix with the gastric contents; or they have resected the acid-secreting portions of the gastric mucous membrane.

Such methods of treatment are often considered very satisfactory, and this may be true of the immediate results. When, however, groups of patients are examined some years after discharge from hospital a different state of affairs is revealed, and the frequency of relapse is demonstrated (Russell 1904, Friedenwald 1912, Nielsen 1923, Crohn 1927, Tidy 1936, Emery and Monroe 1936). This paper reports a study of 435 patients suffering from peptic ulceration admitted to two medical wards of Aberdeen Royal Infirmary between 1927 and 1936. The presence of an ulcer was proved radiologically, at operation or at autopsy. The investigation was carried out between 1937 and 1939 under the direction of Prof. L. S. P. Davidson.

MATERIAL

The average age of the patients at the onset of symptoms was 32·5 yr. In all, 387 (89%) patients were successfully traced and examined. Some had undergone an operation on the stomach or duodenum before admission to the medical wards, and others were transferred from medical to surgical wards for operation. Therefore the results have been reported in "medical" and "surgical" groups, the former containing 320 cases, the latter 115. Cases of perforation dealt with by simple closure and subsequent medical treatment are included in the former group.

The hospital records showed that before discharge from hospital radiological evidence of healing was found in 201 of the 389 patients successfully traced. In the remaining 119 patients discharged free of symptoms healing was not radiologically verified. Of the 86 patients discharged from hospital still suffering from dyspepsia evidence of healing was present in 13 cases, the ulcer crater was still demonstrable in 17, and in the remaining 56 there was no record that a radiological examination had been carried out before the patient was discharged.

Nielsen (1923) has published figures which indicate that if an accurate estimate of the late results is to be obtained, the minimum period of follow-up should be two years, and should extend for ten years. The condition of the patients in this series was studied (*a*) on discharge from hospital ("immediate" results) and (*b*) at examinations carried out from two to twelve years after discharge ("late" results), the average time, to the nearest half-year, being four years. The periods between discharge from hospital and the follow-up examination were as follows.

RESULTS

Years	*2–4*	*4–6*	*6–8*	*8–10*	*10–12*
No. of cases	184	127	33	23	20

The patients have been classified into five groups according to the course of the disease since discharge from hospital.

1—No symptoms; on full work and full diet.
2—No symptoms if careful with diet; on full work.
3—Improved, but some dyspepsia, even if on diet.
4—Not improved; frequently off work.
5—Dead.

TABLE I—IMMEDIATE AND LATE RESULTS IN ALL PATIENTS

Group	Immediate		Late		Mean follow-up (yr.)
	No.	(%)	No.	(%)	
1	320	73·6	73	18·9	4
2	..	..	84	21·7	3·5
3	..	..	75	19·4	5
4	86	19·7	89	22·9	3·5
5	29	6·7	66	17·1	4
—	435	100	387*	100	—

* Remainder not traced.

The immediate and late results for all patients are shown in table I. It is worth noting that 320 (73·6%) were discharged free of symptoms, 86 (19·7%) were not improved by treatment, and the immediate mortality was 29 (6·7%). At the examination from two to twelve years later the number remaining symptom-free had fallen to 73 (18·9%), and those patients forming groups 2 and 3 amounted to 159 (41·1%). In the interval 66 of the patients had died, 24 of these deaths being due directly to the ulcer, and 19 to some other disease; in 23 cases the cause of death was not discovered.

The number of patients suffering from gastric ulcer in this series was small (54), but when the results for gastric and duodenal ulcer were examined separately the late results for gastric ulcer were much worse, and the mortality much higher, than for duodenal ulcer.

In table II the figures for the immediate and late results following medical and surgical treatment are shown separately. Surgical treatment is responsible for the biggest proportion of the best results (i.e., group 1), but if groups 1, 2 and 3 are considered together there is no significant difference between the medical and surgical figures, 60·6% and 57·8% respectively.

The great majority of patients suffering from severe hæmatemesis were treated medically, and many patients were selected in medical wards as being suitable for surgical treatment—e.g., long-standing cases of organic pyloric stenosis. A comparison of the results in 128 patients in the medical group and 50 in the surgical group whose cases were uncomplicated either by hæmorrhage or by obstruction shows that there is no significant difference between the immediate medical and surgical results (table II). As regards the late results, a higher percentage of the best (group 1) follows surgical treatment in uncomplicated cases, but the figures are not statistically significant. After medical treatment a bigger number of patients fall in groups 2 and 3, however, and a smaller number in group 4, than after surgical treatment. There is no significant difference in mortality between medically and surgically treated patients.

Gastroenterostomy for pyloric stenosis has always been considered a satisfactory operation. A higher percentage of group 1 results (28·3%) and of groups 1, 2 and 3 results (82·7%) follows this operation for stenosis than is obtained in any other type of case by any form of treatment. The number of patients suffering from organic pyloric stenosis who are not improved by this operation is very small (table III).

It is obviously important to study any factors which may influence the course of the disease, in view of the depressingly large number of relapses which occur, whether medical or surgical treatment is employed.

TABLE III—LATE RESULTS OF GASTROENTEROSTOMY IN CASES OF STENOSING AND NON-STENOSING PEPTIC ULCER

Group	Stenosing			Non-stenosing		
	No.	%	Follow-up (yr.)	No.	%	Follow-up (yr.)
1	13	28·3	4	8	25·8	4
2	13	28·3	3·5	4	12·9	3·5
3	12	26·1	3·5	5	16·1	8
4	3	6·5	6	12	38·7	5
5	5	10·8	8	2	6·5	5
—	46	100	—	31	100	—

FACTORS INFLUENCING IMMEDIATE RESULTS

Acid factor.—Evidence has been published already (Nicol 1939) to show that peptic ulcers heal satisfactorily in spite of high concentrations of free hydrochloric acid in the gastric contents. Hourly or two-hourly feeds of milk or milky foods, combined with doses of olive oil, alkalis and belladonna, as recommended by Hurst (1929), do not control gastric acidity over 24-hour periods any more satisfactorily than diets consisting of four meals a day. Recently Smith (1941) has confirmed these findings.

TABLE IV—THE EFFECT OF OPERATION ON GASTRIC ACIDITY IN STENOSING AND NON-STENOSING ULCER

—	Group	Number	Average years after operation	Mean max. free HCl (Ewald units)							
				Before operation				After operation			
				Sten.		Non-sten.		Sten.		Non-sten.	
				No.	Acid	No.	Acid	No.	Acid	No.	Acid
Gastro-enterostomy	1	12	3·5	7	24	5	52	7	42	5	50
	2	8	4	4	44	4	60	4	30	4	54
	3	13	4·5	6	66	7	70	6	77	7	67
	4	8	4·5	6	62	2	46	6	39	2	41
Gastrec-tomy	1	4	3·5		70				24		
	2	3	2·5		89				60		
	3	2	4·5		76				39		
	4	1	3		72				0		
Pyloro-plasty	1	0	..		..				..		
	2	2	4·5		43				36		
	3	1	8		57				56		
	4	2	6·5		38				46		

Sten = stenosing.

The effect of surgical operations on gastric acidity have been studied by comparing the preoperative readings with the postoperative findings at the follow-up examination, and these are shown in table IV, classified according to the results of treatment. A reduction in the concentration of free hydrochloric acid, if it occurs, apparently bears little relationship to the clinical improvement produced by the operation, whether the case is one of stenosing or non-stenosing ulcer. The only deduction to be made from these figures is that some

TABLE II—IMMEDIATE AND LATE RESULTS OF MEDICAL AND SURGICAL TREATMENT

Group	ALL CASES										UNCOMPLICATED CASES									
	Medical					Surgical					Medical					Surgical				
	Immediate		Late		Mean follow-up (yr.)	Immediate		Late		Mean follow-up (yr.)	Immediate		Late		Mean follow-up (yr.)	Immediate		Late		Mean follow-up (yr.)
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
1	227	70·9	42	15·1	3·5	93	80·8	31	28·5	4	120	80·5	21	16·4	4	46	82·1	14	28	3·5
2	..	..	65	23·4	4·5	..	..	19	17·4	5	..	..	25	19·5	5	..	..	2	4	4
3	..	..	62	22·1	3·5	..	..	13	11·9	4·5	..	..	39	30·5	3·5	..	..	6	12	7
4	72	22·5	59	21·5	4	14	12·2	30	27·5	3	28	18·8	26	20·3	3·5	8	14·3	22	44	5
5	21	6·6	50	17·9	4·5	8	7	16	14·7	4·5	1	0·7	17	13·3	4·5	2	3·6	6	12	4
	320	100	278*	100	..	115	100	109*	100	..	149	100	128*	100	..	56	100	50*	100	..

* Remainder not traced.

factor influences the symptoms and healing to a greater extent than does free hydrochloric acid.

Motor factor.—It has been suggested that frequent small feeds reduce the motor activity of the stomach, and so assist healing of the ulcer. Radiological investigation of many of these patients did not confirm this finding. Gastric movements were least, for a period up to three hours, after a normal sized meal. A similar diminution of motility was never seen when the patients were on frequent small feeds. When 5 oz. of milk or milk pudding, and antacids and belladonna are given to patients suffering from peptic ulcer, it has been found that the bulk of each feed has left the stomach within 20–40 minutes. Larger feeds of more solid puréed food remain in the stomach for a longer time, up to three hours (Nicol 1939). These findings indicate that frequent small feeds do not inhibit gastric motility as satisfactorily as larger meals given at longer intervals.

FACTORS INFLUENCING LATE RESULTS

Age at onset of symptoms.—During this investigation it was found that the earlier in life a patient's symptoms start the better are the ultimate results. Of those whose symptoms began before the age of 20 years, 72% were found to fall in groups 1, 2 and 3 at the follow-up examination. This percentage fell progressively until, in those patients whose dyspepsia started at 50 or over, the figure was 45% in groups 1, 2 and 3.

Duration of symptoms before treatment.—The average duration of symptoms before admission to hospital was 7·5 years, being 7·3 years for duodenal and 8 years for gastric ulcer. The time elasping between the onset of symptoms and the start of treatment did not influence the ultimate prognosis significantly. This is opposed to the findings of Dunlop and Murray-Lyon (1932) and of Farquharson (1935).

Treatment employed.—It has been shown above that an equally high proportion of relapses follows either medical or surgical treatment. The biggest number of good results is found after gastroenterostomy in patients suffering from organic pyloric stenosis. Very poor results are a sequel to surgical treatment for non-stenosing duodenal ulcers.

In this series the medical treatment used from 1927 to 1932 was that recommended by Sippy. After 1932 this was stopped in favour of a strict Hurst diet. No significant difference was found between the late results of these two methods of treatment. In view of this finding, and of Meulengracht's reported success using a much fuller diet, 40 patients with proved ulcers were treated in 1938 and 1939 by rest in bed and a full diet consisting of four meals a day, the only precaution taken being to sieve any rough articles of food. The immediate results were as good as, if not better than, those obtained using the stricter methods of dieting. Healing was watched radiologically in all these patients, and gastroscopically in two suffering from gastric ulcers. The ulcer craters were completely covered by epithelium in six weeks in one and seven weeks in the other. The average duration of treatment in hospital for this group of patients was four weeks, the same as for patients on a strict diet and antacids.

DISCUSSION

This analysis has shown that 70–80% of patients, after medical or surgical treatment in hospital, are temporarily "cured,"—i.e., symptom-free and on full work. After a few years only 15–20% will remain "cured," and a further 15–40% will be "improved"—i.e., better than before treatment but still suffering from dyspepsia if not careful with their diet.

In this series gastroenterostomy was used much more frequently than any other operation. The numbers of each type of operation performed on those patients who were successfully traced are as follows:—

Gastroenterostomy	..	71
Gastrectomy	..	12
Local excision or wedge resection	..	12
Pyloroplasty	..	10
Gastroduodenostomy	..	4 = 109

Thus the possibility that gastrectomy or other operation may lead to a higher percentage of good results than those reported here cannot be dismissed.

There appears to be little to choose between the medical and surgical results as a whole, but the good results of gastroenterostomy in cases of pyloric stenosis counteract the bad results of surgery in patients with non-stenosing ulcers. This is not a reflection on the surgical treatment of peptic ulcer, but indicates that a poor selection of patients for operation was made in certain cases. The results, considered as a whole, suggest that gastroenterostomy should not be performed on a patient with a patent pylorus. It is interesting to note, however, that a similar percentage of the best results (group 1) followed gastroenterostomy for stenosing ulcer (28·3%, see table III), gastroenterostomy for non-stenosing ulcer (25·8%, see table III), and also the surgical procedures employed in the treatment of uncomplicated peptic ulcer (28%, see table II). This was a higher percentage of group 1 results than that following medical treatment in these types of case. It is only when groups 2, 3 and 4 are considered together that the excellent results of gastroenterostomy for stenosing ulcer stand out, and that medical treatment is seen to be of more value than surgical treatment for patients with ulcers uncomplicated by pyloric stenosis.

It has not been possible to demonstrate any clinical feature by which the patients with non-stenosing ulcers who remain "cured" after gastroenterostomy or other operation can be differentiated from those who are liable to relapse, and it has been impossible to differentiate between the patients with a patent pylorus who do well after medical treatment and those in the same category who do badly. The histories of the patients in this series, taken at the follow-up examination, showed that the treatment and self-medication employed at home made little difference to the progress of the case. Indeed, the patients who did best (groups 1 and 2) were, with a few exceptions, less careful in their dietary regime, and took less in the way of alkalis and antacids, than those whose symptoms persisted (groups 3 and 4).

Neither medical treatment nor gastroenterostomy reduces the concentration of hydrochloric acid in the gastric contents to any appreciable extent. After gastrectomy the concentration of hydrochloric acid may be reduced, but the reduction does not seem to be related to the clinical improvement, if any, resulting from the operation. In spite of these findings regarding gastric acidity, ulcers heal satisfactorily, and do so whether the patient is on a strict diet, combined with atropine and antacids, or is having four meals a day.

The only common factor in the forms of treatment investigated was rest in bed, and there can be little doubt that mental and physical rest is the most important part of the treatment of active peptic ulcer. A long history of dyspepsia before treatment is started does not reduce the expectation of improvement, or even of "cure."

SUMMARY

The immediate and late results of treatment of peptic ulceration in 387 patients have been analysed.

On discharge from hospital 73·6% of patients, whether treated medically or surgically, were free from symptoms, 19·7% were not improved by treatment, and the immediate mortality was 6·7%. After 2–12 years the percentage remaining symptom-free fell to 16·8%, but a further 41·1% remained sufficiently well to be able to work, if careful with their diet.

The results of treatment appeared to be slightly better in patients whose symptoms began at a early age.

The duration of symptoms before admission to hospital did not influence the prognosis.

Gastroenterostomy was highly successful in the treatment of ulcers causing pyloric stenosis, but in cases of non-stenosing ulcer medical treatment was more successful than surgery. The number of cases submitted to operations other than gastroenterostomy, however, was too small for definite conclusions to be drawn.

I wish to thank Prof. L. S. P. Davidson for his help during the investigation and in the preparation of this paper; Dr. J. Alexander Innes and Dr. A. W. Hendry for access to patients and case-records; and Dr. J. McCrie for valuable criticism.

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ASPIRATION OF PETROL

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ASPIRATION of petrol into the lungs seems to be an uncommon accident and reports of its effects are rare, but war-time petrol restrictions have increased the temptation to siphon it from one container to another and sucking at tubes to establish such siphons has led to aspiration of the liquid. A fatal accident apparently from this cause occurred recently in Winchester and was reported in the daily press. In the following case the patient recovered.

CASE-HISTORY

A healthy man of 28, employed as a lorry driver, was trying to remove sediment from the petrol tank of a tractor and was sucking at a tube of about 1½ in. bore in order to establish a siphon by which to run off the petrol. He felt some petrol enter his mouth ; the quantity was later estimated to be ¼ pint. A part was swallowed but some was felt to "go the wrong way." He tried to cough it out, but in a few seconds became very short of breath. He beckoned to a friend to slap him on the back and remembers this being done. He felt as though "bursting for breath" and lost consciousness, becoming deeply cyanosed. On recovering consciousness a few minutes later he felt light-headed, sick and weak but could breathe more easily. Deep inspiration caused slight pain in the lower right chest. He was given an emetic which caused vomiting and after about five minutes was able to walk unaided about 50 yards to a shed where he lay down. He now felt much better and had little nausea, but gas eructated from the stomach smelt of petrol. He was put to bed and given a further emetic. Two hours later the pain in his right chest had increased greatly and his cough was worse. After coughing he could taste and smell petrol in his mouth. He vomited several times during the next 24 hours, the vomit still tasting and smelling of petrol. There was no epigastric pain or diarrhœa. Pain in the chest continued and was made worse by coughing. A dark brownish sputum began to appear. He was admitted to the Radcliffe Infirmary on the third day.

His general condition was fairly good but he had slight cyanosis and moderate dyspnœa. Temperature 100·8° F., pulse-rate 100 per min. with good volume ; respiration-rate 36. No odour of petrol in the breath ; tongue coated. Diminished movement of the right chest and mediastinum displaced to left, apex-beat being 1 in. external to nipple line. Breath sounds poor at right base where there were signs of a pleural effusion of moderate size. Ægophony and tubular breathing heard above angle of right scapula ; no pleural friction or adventitious sounds heard at any time. Left lung showed no abnormal signs. Small amount of sticky mucoid sputum which was moderately bloodstained and contained many pneumococci. Heart normal ; blood-pressure 106/78 mm. Hg. Blood-count showed leucocytosis of 12,000 but no other abnormality. No abnormality in abdomen or nervous system. Clear yellow fluid, 15 oz., removed from right pleural cavity. This fluid did not smell of petrol ; it contained only an occasional pus cell and both aerobic and anaerobic cultures were sterile. Sulphapyridine given as a precautionary measure for 7 days had little effect on the temperature, which fell gradually to normal in 10 days. Further smaller quantity of fluid was aspirated 3 days after first aspiration ; character unchanged. After few days in hospital chest pain disappeared and patient felt well. X ray of chest on admission showed opacity due to pleural effusion but above this there was a suggestion of coarse mottling in the lung, possibly due to small patches of consolidation ; mottling disappeared in a few days though absorption of remaining fluid was slow. A month after admission movement of right chest was still much impaired in spite of breathing exercises. Right base was still dull to percussion with almost absent breath sounds, but vocal fremitus was now increased. Opacity was still present in the radiogram, suggesting a small amount of persistent fluid but none could be obtained on attempted aspiration. Patient was sent home to convalesce.

A week later the lung signs were only slightly improved. Chest expansion was only ½ in. on the right side compared with 1½ in. on the left. He now returned to work and 3 weeks later expansion was almost equal on the two sides and in a further week completely so. Breath-sounds were still much weaker on the right side and slight dullness was still present. At this time, over 8 weeks after the original accident, X rays showed some persistent opacity of the right lower lung field reported to be "consistent with resolving pneumonia." He was free of all symptoms.

DISCUSSION

When petrol or kerosene are swallowed in mistake for other liquids some may enter the lungs and pneumonic signs may result (Waring 1933), and many such cases are on record mainly in small children ; but as a rule the pulmonary signs are not the main feature of the clinical picture, in which collapse is often severe, unconsciousness common and alimentary signs prominent. All the reported cases of primary aspiration of petrol which I have found have resulted from sucking at wide tubes or petrol pipes in order to establish a flow, an ideal way of provoking such an accident.

The effects of aspiration of petrol can be divided into three groups :

Immediate effects, due to the presence of an irritating fluid in the bronchial tree, were well illustrated in the case here recorded, which in this respect may be regarded as typical. Sometimes there is in addition a burning sensation in the mouth. If much enters the lungs rapid death from asphyxia may result. If much is swallowed burning pain in the œsophagus, epigastric pain, nausea, vomiting and diarrhœa may result, and collapse may be extreme with much cyanosis. The severity of the alimentary symptoms varies and is not closely related to the amount swallowed.

General effects, due to absorption of petrol into the blood-stream, are seen in uncomplicated form when petrol vapour is inhaled, for instance in garage-pits. A transient exhilaration is felt which soon passes into drowsiness, with singing in the ears, cyanosis and unconsciousness ; it is reported that inhalation of 20–40 gr. of petrol as vapour in 10 minutes will produce unconsciousness lasting 2–8 minutes (Levin 1888). On recovery of consciousness nausea, dizziness, headache and drowsiness may persist for some time. It seems probable that the unconsciousness in the present case was due to asphyxia, but the subsequent lightheadedness may well have been a manifestation of mild petrol toxæmia. Petrol in the blood-stream is largely excreted in the expired air and by irritating the lungs may cause bronchitis and coarse crepitations in the chest. The presence of such crepitations in a person who has swallowed petrol should not therefore be regarded as evidence that petrol has been directly aspirated into the lungs. Legludic and Turlais (1914) have shown that intravenous injection of small quantities of petrol in rabbits and dogs often leads to dyspnœa, cyanosis and pulmonary congestion, and sometimes even to hæmorrhagic and other pleural effusions. It is unlikely, however, that when petrol is aspirated into the lungs symptoms referable to petrol in the blood-stream play more than a minor part in producing the clinical picture.

Delayed effects.—Information on the effects of petrol on the bronchi and lungs is scanty. According to Sollmann (1936) a hæmorrhagic pneumonia may result but the source of this statement is not given. Nunn and Martin (1932), who reported a large series of cases of petrol and kerosene poisoning in young children, found signs of pneumonitis in all fatal cases and noted that in cases which recovered the pulmonary signs disappeared within 48–72 hours. But they apparently regarded the lung signs as evidence of aspiration, whereas, as I have pointed out, they are not necessarily so if much petrol

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has entered the blood-stream. The rapid disappearance of the pulmonary signs in Nunn and Martin's series suggests that they arose from excretion of petrol by the lungs rather than from its aspiration. Injection of kerosene—which apparently behaves like petrol—into the trachea of a dog produces death in a few hours with œdema of the lungs and a hæmorrhagic pneumonia, the alveoli being filled with exudate containing many lymphocytes (Waring 1933). It is clear therefore that the lungs suffer a severe insult when kerosene enters them and the same is undoubtedly true of petrol. The signs in our case were consistent with an acute hæmorrhagic pneumonitis similar to that found in Waring's dogs, though the rapid onset of pleural effusion was an added feature.

We have found only 3 previous records of pleural effusion resulting from aspiration of petrol, though it has been produced experimentally in animals given intravenous petrol (Legludic and Turlais 1914).

In 1922, St. Leger reported the case of a man of 34 who aspirated petrol into his lungs while sucking at a petrol pipe. Acute pain was felt in the hypochondrium, but he developed no cough or cyanosis at first; 6 hours later he had cough with blood-stained sputum and this was followed by a pleural effusion which persisted for 14 days but did not require tapping.

In 1933, Schneider published details of a boy of 17 who inhaled petrol into his lungs in the same manner. Severe respiratory distress and cyanosis with pain on the right side resulted; signs of a right effusion developed; the temperature rose to 101·5° F. There were albuminuria and a leucocytosis of 14,000, but the boy had fully recovered a month after the accident.

Another case was recorded by Johnstone in 1938. The patient was a man of 31 and aspiration was again the result of sucking at a wide-bore (1½ in.) pipe to establish a siphon. Burning in the throat, dyspnœa and severe pain in the right chest were early features with ashen cyanosis; temperature rose to 102·4° F. Scattered râles were present in both lungs but signs of a right effusion soon appeared. The fluid had no odour of petrol and cleared up completely in about 8 days. X rays of the chest, as reproduced, did not suggest the presence of an underlying pneumonia.

But petrol aspiration does not necessarily result in pleural effusion; there was none in an instructive case reported by Battley (1930).

A boy of 8 years inhaled petrol into his lungs when sucking at a tube. The quantity was probably large. Immediate severe collapse with cyanosis occurred. Widespread râles were heard in the lungs with bronchial breathing at both bases. Wandering pneumonic signs persisted for nearly 2 months, after which he seemed well in spite of fine râles being still audible at the right base. In the early stages there was a moderate fever with a leucocytosis of 20,000; lung-puncture was sterile. A taste of petrol persisted in the mouth for 4 weeks.

Brief mention of two cases in children aged 6 and 10 years is made by Williams (1927); in one there were dyspnœa and tachycardia, in the other severe pain in the chest but apparently no pneumonia. No further details were given.

These 6 additional cases are all I have been able to find in the published work, but the rarity of case-reports probably gives a false impression of the frequency of this kind of accident, since most cases probably remain unreported. From this brief series it may be concluded that if the aspiration is not immediately fatal either a patchy pneumonia or a pleural effusion may develop. As with other foreign matter in the lung, the right side is more often affected than the left. The pneumonia may be expected to clear up gradually within a few weeks, the pleural effusion will usually remain sterile and be reabsorbed in less than 4 weeks, though residual signs may persist longer. Probably no permanent disability results, but no information seems to be available about the more remote effects of the accident. It is possible, for instance, that in some circumstances chronic fibrosis or even bronchiectasis might gradually develop, though no cases have been reported.

Treatment must be general and symptomatic. Washing out the stomach is probably preferable to the use of emetics, because of the risk of further aspiration of stomach contents during vomiting. Oxygen may be required if cyanosis is severe. Sulphapyridine has apparently no influence on the course of the lung lesion but seems reasonable therapy as a deterrent to secondary infections. Breathing exercises are desirable after the acute symptoms have passed, to encourage re-expansion of the lung. Tapping of the pleural effusion is not usually necessary but a sample of the fluid should be removed for examination, and advantage should be taken of this opportunity to withdraw as much fluid as possible. The tendency to further accumulation seems to be small.

Since these notes were compiled a full review of all aspects of petrol poisoning by both liquid and vapour has been published by Machle (1941). His careful survey of published work throws no further light on the effects of petrol aspiration into the lungs.

SUMMARY

A case of aspiration of petrol into the lungs by a man of 28 is reported. He lost consciousness for a few moments at the time and afterwards developed a right pleural effusion with patches of pulmonary consolidation. He recovered.

Published cases are reviewed. These show the immediate effects of petrol aspiration to be signs of irritating fluid in the bronchial tree (cough, cyanosis, asphyxia) or stomach (pain, vomiting, diarrhœa); collapse may be severe, or the patient may die from asphyxia. General effects are transient exhilaration, drowsiness, cyanosis, unconsciousness, and on recovery nausea, dizziness and headache. Delayed effects reported are wandering pneumonia, hæmorrhagic pneumonia, pneumonitis and pleural effusion.

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STAPHYLOCOCCAL SEPTICÆMIA

TWO CASES TREATED WITH SULPHATHIAZOLE

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STAPHYLOCOCCAL septicæmia has a high mortality. A few cases may be saved by prompt surgical elimination of the focus of infection before metastases or the septicæmia overwhelm the patient. Every surgeon is aware, however, of how rarely this can be achieved and he has also seen the chronic osteomyelitis case fail to master his infection despite repeated operations. There was no reliable drug the surgeon could call to his aid until the advent of the sulphonamides. Sulphathiazole is the best drug at present available for the treatment of staphylococcal infections, but the results here have never been as satisfactory as those achieved in the treatment of other coccal infections by this and other sulphonamides. Butler (1940), for example, writes "sulphathiazole seems to have little or no beneficial effect on staphylococcal infections where there is a positive blood-culture," but a few successes in staphylococcal septicæmia have been reported by McCrea (1940; 2 cases), by Melton (1941; 5 out of 13 cases) and by Heselson (1941; 1 case). Melton and Heselson used continuous intravenous administration of sodium sulphathiazole solution to maintain a high blood concentration of the drug in addition to oral doses and Melton also gave staphylococcal antitoxin in 4 of the successful cases. Soluble sulphathiazole was not available to us when treating our cases and we had to rely on large and continued oral dosage. The 2 cases reported here were in military patients.

Surgeons are often over-cautious in their use of drugs, but toxic reactions should be risked freely in dealing with

so grave a condition as staphylococcal septicæmia. One of our purposes in reporting these cases is to show that the administration of sulphathiazole can be continued far beyond the limits usually regarded as constituting a fair therapeutic trial, and that the chance of success may be lost by setting an arbitrary limit to the dosage.

CASE-HISTORIES

CASE 1.—Man of 36. Crop of boils appeared on both forearms early in March, 1941; 3 weeks later complained of right sciatic pain. X ray showed only little mottling of ilium. Attended as outpatient for physiotherapy, but a week later developed increased pain and pyrexia. March 30 admitted. Temp. 103° F., pulse-rate 90; resp. 32. Acute tenderness in right loin. No abnormal signs in chest or abdomen. History of earlier attacks of lumbago; pain thought to be rheumatic. Aspirin failed to control pyrexia. Urine: febrile albuminuria and casts. April 3, dyspnœa, cyanosis, cough and sputum; signs of bilateral bronchopneumonia confirmed by X ray. Sulphapyridine, 1 g., intravenously followed by 1 g. 4-hourly by mouth (see table). Vomited after 12 g.; further 12 g. given in intramuscular injections 4-hourly. April 8, still very ill with physical signs of bronchopneumonia; blood-culture grew *Staph. aureus* in saponin-broth-agar medium (Penfold et al 1940). By April 10, 36 g. of sulphapyridine had failed to influence pyrexia, and drug was stopped. Swelling in right loin needled; sterile serous fluid withdrawn.

April 11, sulphathiazole begun, 2 g., followed by 1 g. 4-hourly by mouth. April 13, pus aspirated from swelling over right external malleolus; *Staph. aureus* grown, coagulase positive. New boil on back; abscesses beginning to form at sites of previous intramuscular injections of sulphapyridine in both upper arms. X ray showed no bone disease. Exploratory arthrotomy of ankle; no pus found. By April 17 was taking 18 g. of sulphathiazole daily by mouth. Chest signs unchanged; patient gravely ill. Dyspnœa treated by oxygen through B.L.B. mask. Lung disease thought to be part of staphylococcal pyæmia, but organisms never actually recovered from sputum. April 21, urine loaded with crystals (170 mg. of sulphathiazole per 100 c.cm.); no albuminuria. Discharging sinus leading from external malleolus dressed with sulphathiazole powder. April 24, morbilliform rash on back of neck, and bilateral conjunctivitis. Next day patient exhausted and disoriented. Rash had extended. Temperature 104·6° F. In past 14 days total of 217 g. of sulphathiazole had been given. Temperature fell immediately on withdrawal of drug and was normal next day; then began to swing again reaching 99°–101° F. in the evenings for next 4 weeks, while infection was becoming localised in right fibula. Arm abscesses healed slowly and lungs cleared. Secondary anæmia treated by two transfusions of fresh blood (1 pint) and iron by mouth.

May 24, operation: saucerisation of lower end of right fibula for osteomyelitis, revealed by X ray. Wound packed with 'Vaseline' gauze, and closed plaster applied. Sulphathiazole, 5 g., given by mouth day before operation, on day of operation itself and on day after, to prevent blood-borne metastasis of infection. Skin rash recurred and there was pyrexial reaction, temperature reaching 104·6° F., but falling promptly on withdrawal of drug. Patient again slightly delirious. Blood concentration, 4 mg. of sulphathiazole per 100 c.cm. Pure culture of *Staph. aureus* (coagulase positive) obtained from fibula.

June 20, plaster renewed with walking iron; wound healing well. July 2, pain in right loin. X ray showed rarefaction of upper part of ilium, resembling inflammatory disease, more definite than appearance in X ray of this part taken in March. July 7, swelling appeared over crest of ilium but exploring needle found no fluid; after 3 weeks rest in bed pain subsided and nothing further developed. Aug. 15, plaster removed. Wound almost healed; dressed daily with sulphanilamide powder. Thirteen days later, blotchy red rash appeared on trunk and arms and around wound, but faded within 2 days of stopping sulphonamide dressing. Discharged recovered in November, 1941.

CASE 2.—Man of 34. Many boils in adolescence. In April, 1941, carbuncle developed on back of right thigh. Fever, but improvement after 5 g. of sulphapyridine and evacuation of pus from carbuncle. About 10 days later pain in right upper arm and fever. Arm poulticed; given small doses of sulphapyridine (2 g. daily) while at home on sick leave. May 16, admitted to hospital with temp. 100·2° F., pulse-rate 112. Acute inflammation around right shoulder and upper arm. Scar of the original carbuncle dry and skin almost healed. Apart from tachycardia, no apparent visceral disease. Urine normal. Looked and felt gravely ill. Septicæmia, with localisation of pus among muscles of right upper arm, diagnosed. Blood-culture: coagulase-positive *Staph. aureus*. Anæmia; white cells 6200. Absence of leucocytosis attributed to sulphapyridine given before admission and still present in the blood in a concentration of 0·5 mg. per 100 c.cm. Sulphathiazole started immediately, 4 g. by mouth followed by 1 g. every 2 hours. May 17, X ray of right arm and shoulder showed no bony change. May 19, better. Fluid intake had been restricted in mistaken attempt to raise blood concentration of sulphathiazole,[1] but heavy deposit of drug appeared in urine on standing, with some albumin; fluids then allowed freely. May 20, drowsy and disoriented. Blood-urea normal. Abscess in arm fluctuant.

AXILLARY TEMPERATURE, TOTAL DOSAGE AND BLOOD CONCENTRATION OF SULPHONAMIDE, AND BLOOD-PICTURE

CASE 1

Date	Max. temp. (° F.)	Sulphonamide: Total to date (g.)		In blood (mg. per 100 c.cm.): Free	In blood (mg. per 100 c.cm.): Total	Hb %	White cells	Polymorphs %
April 1	101·2		..	..	..	102	11,000	86
8	101·6	Sulphapyridine	24	3·5	5	..	..	..
9	102·4		30	3	5	..	..	..
10	103		36	..	..	90	20,700	92
11	102·8		..	..	..	..	..	..
12	103·2		9	2	2·5	..	..	..
15	99·8		44	2	2·5	..	..	..
16	102	Sulphathiazole	60	5	..	..	17,000	86
19	101·8		90	8	9·5	65	14,500	86
21	101·8		132	6·3	7	..	17,300	87
25	104·6		217	..	..	..	..	..
28	99·6		..	..	..	..	11,500	85
May 23	100·2		..	..	..	..	..	..
24	103	Sulphathiazole	10	4	..	..	..	..
25	104		15	..	..	..	..	..
26	98·6		..	..	..	70	10,500	85
June 2	98·4		..	..	..	68	9200	65
Sept. 9	98·4		..	..	..	90	8800	71

CASE 2

May 16	102	Sulphapyridine *		0·5	..	85	6200	79
17	101·4		14	2·5	..	..	9900	80
19	99·8	Sulphathiazole	33	3·8	4·2	..	12,800	78
21	101		54	2·8	3·5	..	..	..
22	100		65	2·8	..	67	9900	83
26	100·4		111	4	..	..	16,500	77
29	102·8		..	..	..	..	14,000	70
30	99·2	Sulphathiazole	12	5	..	..	..	..
June 1	100		32	..	..	..	..	..
7	100·2		..	..	..	72	20,000	81
11	99·4	Sulphathiazole	6	4	5	..	..	..
13	102		26	..	..	..	..	..
20	99·6		..	..	..	62	14,000	66
Nov. 18	98		..	..	..	81	9400	78

* 12 in 6 preceding days.

May 21, operation: incision of abscess with drainage under 'Evipan' anæsthesia. Pure culture of *Staph. aureus* grown from pus. General improvement for several days but temperature still swung to 100° F. or 101° F. on most evenings. Drug fever suspected and sulphathiazole discontinued on May 26 after 111 g. had been given. Evening temperatures, however, increased to 102·8° F. Sulphathiazole started again on May 30; after further 32 g. had been taken maculopapular rash appeared on both legs, back of neck and around eyes; mild conjunctivitis of left eye. Sulphathiazole stopped. Swinging temperature persisted; signs of localisation of infection in right humerus, confirmed by X ray on June 9. Second blood-culture on this day sterile.

June 11, operation: saucerisation of upper half of shaft of right humerus; vaseline gauze pack; plaster spica. Pint of plasma transfused at end of operation. Sulphathiazole, 6 g., given by mouth in 4 hours preceding operation raised blood concentration to 4 mg. per 100 c.cm. Further 20 g. given during next 48 hours evoking toxic reactions—mild delirium, rapid pulse, slight cyanosis and severe conjunctivitis of left eye. General state resembled delayed shock. Sulphathiazole

1. Alyea and his colleagues (1939) have shown that blood concentration of a sulphonamide does not vary with fluid intake. Functional impairment of kidneys raises blood concentration of drug, but in patients with normal renal function forced or restricted fluid intake affects only concentration and not total excretion of drug in urine.

stopped and rectal salines given. Next day temperature fell and patient improved rapidly.

Some fever continued until June 24 when wound dressed with sulphanilamide and new plaster applied. Became a case of chronic osteomyelitis; was walking about for much of this time, gradually improving. By October, 1941, new small focus of bone infection had formed in subperiosteal area of lower part of shaft of same bone.

On Oct. 23 new openings made into marrow cavity of humerus and many sequestra, some of considerable size, removed. Within 10 days he was on his feet again and has had no pyrexia since. General state is excellent and local condition shows promise of recovery.

DISCUSSION

The early part of the illness in these two patients followed a familiar course. Both were gravely ill with positive blood-cultures and the clinical signs of septicæmia. The infection eventually became localised in a bone in each case. The bronchopneumonia in case 1 was probably staphylococcal. It did not resolve under the influence of sulphapyridine, and staphylococci were recovered from the blood after 24 g. had been taken. Pyæmic abscesses formed in the muscles of both upper arms at injection sites and new boils developed on the skin. All these resolved and the blood became sterile and the final locus of infection became an osteomyelitis of the fibula, a situation accessible to surgery. The 217 g. of sulphathiazole administered to this patient produced unpleasant toxic reactions but undoubtedly saved him from death in the pyæmic phase and paved the road to eventual recovery. In case 2, the septicæmia continued for about a week before a local collection of pus formed. The radiological evidence indicates that no serious infection of the humerus was present before sulphathiazole was given. Though the bone infection was not prevented, the blood was sterilised and further metastasis of the infection was avoided. Pyrexia continued after the blood had become sterile but the improvement in the patient's general condition distinguished this later phase of the disease from the early septicæmic stage. Osteomyelitis was not averted in either case, which supports the view that the sulphonamides have relatively little effect on localised infections and thus offer no excuse for lessening surgical endeavour.

The dosage of sulphathiazole was much larger than any previously reported. A total of 232 g. was given in case 1 and of 169 g. in case 2; in addition case 1 had 36 g. and case 2 12 g. of sulphapyridine before sulphathiazole was begun. Sulphathiazole was given entirely by mouth in the form of crushed 0·5 g. tablets of 'Thiazamide' (M&B 760). Small amounts of bicarbonate of soda were given with each dose. The maximal daily dose was 18 g. (three tablets 2-hourly) which was given on 9 consecutive days to case 1. The commonest daily dose in case 2 was 12 g. (two tablets 2-hourly). During the first continuous course case 1 received 217 g. in 17 days, and case 2 received 111 g. in 10 days followed by 32 g. in 3 days after a 3-day intermission. In both patients a further short course of the drug (25 g. in case 1; 26 g. in case 2) was given over the time of operation, to prevent dissemination of the infection.

Blood concentration of free sulphathiazole did not exceed 8 mg. per 100 c.cm. in case 1 or 5 mg. per 100 c.cm. in case 2. These concentrations are much below the 15 mg. per 100 c.cm. which Melton (1941) considered should be attained. Sulphathiazole is more rapidly eliminated than either sulphapyridine or sulphanilamide and it seems difficult to maintain high concentrations by mouth. The lower concentrations, however, coupled with the long period of administration appeared to be effective. The blood concentration of conjugated sulphathiazole was always low and less than we have generally found in patients treated with sulphapyridine.

Urinary concentration of sulphathiazole was very high, reaching 170 mg. per 100 c.cm. in case 1 and 500 mg. per 100 c.cm. in case 2. The latter figure is above the experimentally determined solubility of the drug at body heat and pH 7·6 (Climenko and Barlow 1941), but Heyl (1941) has also recorded a comparable figure. There was slight albuminuria but neither blood nor casts and no permanent renal damage resulted. Fluid intake should be pressed to the limit of comfort with all patients taking large doses of sulphonamides; this does not reduce the blood concentration of the drug but it does diminish the risk of kidney damage by crystals precipitated from supersaturated urine. The blood-urea was not raised in case 2 towards the end of the first course of the drug.

Toxic reactions differed from those we have encountered in sulphapyridine therapy. The huge doses which were tolerated show that sulphathiazole is the least toxic sulphonamide at present in common use. Cyanosis was mild and caused no alarm. Vomiting was slight and only interfered once with the continued oral administration of the drug. Polymorph leucocytosis was well maintained (see table) and anæmia could not be dissociated from the effects of the infection alone. Mild delirium was prominent in both our patients, and seemed to be due to the drug. It disappeared rapidly when the drug was withheld and reappeared when it was given again. Sulphathiazole certainly added to the patient's malaise and we agree with Heyl's (1941) remark that "most patients are very grateful to be off the drug." Drug fever occurred, the evening temperature reaching great heights towards the end of the first course in case 1 and subsiding as soon as it was stopped; high fever was again induced by the second course. Toxic dermatoses developed in both patients. These were a morbilliform rash in the first case and a maculopapular rash in the second. Conjunctivitis also occurred in both patients. The rapidity with which these toxic reactions reappeared in the second courses of sulphathiazole—begun 28 and 10 days after the end of the first course—suggests that the patients had become hypersensitive. In case 1 even small local applications of sulphanilamide to the wound caused reappearance of the toxic rash three months after the last oral dose of sulphathiazole. We do not know how far this sensitivity might militate against future sulphonamide therapy. It seems important to determine the time of administration and the dosage which induce this hypersensitiveness, and the incidence of susceptibility.

The importance of combining the fullest surgical endeavour with sulphathiazole treatment cannot be too highly stressed. The drug alone failed to curb the development of osteomyelitis. It saves life in septicæmia and pyæmia where operative surgery is powerless, but is itself powerless to resolve localised infections. We twice used the drug as a prophylactic against dissemination of infection at operation, and recommend the measure in debilitated subjects despite the risk of unpleasant toxic reactions. Sulphathiazole, 6 g. in the 6 hours preceding operation, raised the blood concentration to 4 mg. per 100 c.cm. at the time of operation. Heyl (1941) is doubtful of its prophylactic effectiveness but he aimed at obtaining a blood concentration of only 2 mg. per 100 c.cm.

Early treatment of septicæmia by adequate doses of sulphathiazole is clearly important. Success must depend partly on there being only a light infection of the blood. In our cases cultures yielded about 10 colonies of staphylococcus per 1 c.cm. of blood. We agree with Butler (1940) that a patient whose blood-culture runs into hundreds of colonies per c.cm. is as a rule past therapeutic aid.

Continued treatment is equally important. Success is probably achieved not so much by the abrupt sterilisation of the blood as by the bacteriostatic activity of sulphathiazole, which maintains the numbers of circulating micro-organisms within such small limits that they can be eventually disposed of by the natural body defences. We urge, therefore, that no arbitrary limit be set to the amount of the drug or the time over which it should be given before it is deemed to have failed. As our cases show, very large total doses of sulphathiazole can be tolerated. Treatment should only be interrupted if one of the following events occurs: pronounced clinical improvement; repeatedly sterile blood-culture; dangerous toxic reactions. Whether the toxicity of the drug or of the infection is more dangerous to life is a matter for individual judgment.

SUMMARY

Two cases of *Staphylococcus aureus* septicæmia have been successfully treated with sulphathiazole.

Massive oral doses were given, the total dosage amounting to 232 g. in one case and 169 g. in the other.

Blood concentrations of the drug were relatively low (up to 8 mg. per 100 c.cm. in one case, 5 mg. per 100 c.cm. in the other) but appeared effective.

Increased malaise, mild delirium, fever, dermatoses and conjunctivitis were the toxic reactions encountered. Both patients developed hypersensitivity to the drug.

The need for early and adequately continued administration of sulphathiazole and for full surgical treatment is illustrated.

We wish to acknowledge the help we have received from Prof. E. J. Wayne in dealing with these cases.

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SALT CONCENTRATION IN BLOOD-GROUPING TECHNIQUE

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UNHEATED sera when undiluted or slightly diluted may fail to cause hæmagglutination, while sera heated at 55° C. in the same circumstances display full agglutinating power. Attention has been called to the inhibition of isoagglutination occurring in undiluted or slightly diluted serum by Holzer,[1] Pondman and Brandwijk [2] and Andersen.[3] Holzer as well as Pondman and Brandwijk have compared this peculiarity to the prozone phenomena in bacterial agglutination, but Andersen stressed the fact that the inhibition of isoagglutination in undiluted serum is not caused by excess of agglutinins. He showed that the inhibition is lessened or disappears as a result of those influences which diminish the complement activity—for example, heating or storing the serum. Nevertheless, he pointed out that agglutination may be inhibited when unheated and stored serum is used, although no visible hæmolysis is detectable.

Complement activity is only one of the peculiar qualities of the globulins present in fresh serum. It is well known that flocculation which corresponds in principle to the phenomenon of agglutination may also be inhibited or prevented by the presence of unheated serum; for example, sera must be heated to 55° C. in doing most of the serological tests for syphilis because otherwise they are liable to give false negative results. In these the heating alters the labile serum proteins which, in unheated serum, inhibit antibody reactions. They become stabilised by heating, and this removes their inhibiting action. However, flocculation tests may be performed with unheated serum if the salt concentration is increased; higher salt concentration prevents the labile globulins from reacting and thus allows flocculation to take place.

This led me to consider whether it might be practicable to perform blood-grouping tests with fresh unheated serum or plasma in the presence of a higher salt concentration than normal. Of course the errors (false negative results) resulting from using fresh unheated serum for typing the blood-groups may easily be avoided if sera used for routine typing of the cells are heated at 55° C. or stored for a sufficient time. On the other hand speed may be desirable and it may be inconvenient to heat the serum or plasma. These considerations will apply especially when examination of the serum is combined—as it always should be—with examination of the blood-cells. No technical mistakes in blood-grouping are possible when this combined procedure is used. But the peculiarities of unheated serum or plasma may interfere with cross-matching before transfusion because, although the corpuscles of the donor contain agglutinogens and the recipient's serum contains the corresponding antibodies, agglutination sometimes fails to occur.

Preliminary experiments showed that sodium-chloride solutions of higher concentration produced the results expected. When typing of the blood-groups was performed on slides (by mixing a drop of fresh serum or plasma with a drop of a roughly 5% suspension of blood-cells) a big difference could be observed on adding a drop of a 3–5% solution of sodium chloride instead of the usual 0·9%. Either agglutination occurred only when the more concentrated salt solution was added, or the speed and strength of agglutination were distinctly increased. The agglutinated particles were strikingly coarse in comparison with those of the controls containing only 0·9% saline.

The increased salt concentration intensifies both the speed and strength of agglutination. Since the result depends on both actions, it was necessary to determine the optimum concentration of sodium chloride. For agglutination tests it seemed convenient to make up the suspensions of corpuscles in salt solution of appropriate strength. For the examination of unheated serum it was found best to suspend the cells in 3% sodium chloride, the cells having a concentration of about 5% for typing on slides and about 1–1·5% for typing in tubes. When equal amounts of serum or serum dilutions and cells were mixed the difference in comparison with suspensions of cells in 0·9% saline was usually quite distinct, as evidenced by the speed of agglutination and the much coarser particles. When unheated serum tends to cause some hæmolysis, this is prevented and agglutination is quickly visible. Even if the serum lacks hæmolytic action or has lost it on storing, the difference is considerable. Suspending the corpuscles in stronger sodium-chloride solutions is clearly a safe way of avoiding false negative results such as may particularly occur on cross-matching.

The increased salt concentration, however, is itself capable of inhibiting agglutination, as may be seen on titrating the sera at higher dilutions. Although the speed and strength of agglutination are at first much increased with high salt concentrations, the end titre may be lower (see table). For this test an unheated serum was used which had no hæmolytic action after 7 days in the refrigerator.

EFFECT OF SALT CONCENTRATION ON AGGLUTINATING ACTION OF UNHEATED SERUM (GROUP O) ON B RED CELLS

Serum dilution	Action at room temperature on red cells suspended in—					
	0·9% NaCl			3% NaCl		
	At 2 min.	At 15 min.	At 1 hr.	At 2 min.	At 15 min.	At 1 hr.
Undiluted	−	+	+	+ + +	+ + + +	+ + + +
1 : 2	−	+	+ + +	+ + +	+ + + +	+ + + +
1 : 4	±	+ +	+ + +	+ +	+ + + +	+ + + +
1 : 8	−	+ +	+ + +	+	+ + + +	+ + + +
1 : 16	−	+(+)	+ + +	−	+ + +	+ + +
1 : 32	−	+	+ + +	−	+	+ +
1 : 64	−	±	+ +	−	−	+
0	−	−	−	−	−	−

Tests performed in tubes by mixing equal parts of about 1% suspension of red cells and serum dilutions in 0·9% saline.

The differences are more pronounced in the incubator than at room temperature or in the refrigerator, although they are evident enough at the temperature of the room in which typing is usually performed.

Another question to be answered is whether the same procedure would be suitable for routine typing when either heated or stored sera are used. And it may also be asked, as Dr. R. A. Q. O'Meara has pointed out, whether the higher salt concentration produces its effect only by electrolytic action or whether the increase in the osmotic pressure on the cells also plays a part. Experiments showed that agglutination with heated serum may also be hastened and intensified by suspending the blood-cells in sodium-chloride solutions of higher concentration, but that a 3% solution sometimes inhibited agglutination. A 2% solution produced the best results, agglutination never being less pronounced than in a 0·9% solution and nearly always being intensified. Mixing equal amounts of serum or serum dilutions in 0·9% and of blood-cell suspensions in 2% sodium-chloride solutions may therefore be recommended as a suitable method for determining the blood-groups. Moreover the resulting salt concentration is usually sufficient, when unheated serum is used, to prevent hæmolysis, though it is possible to make even surer that hæmolysis will be avoided by suspending the cells in 3% sodium-chloride solution.

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The agglutination may not, of course, always be intensified when heated serum is used though it usually is. In my experience isoagglutination always occurs except with a few exceptionally weak samples of A cells (apparently those belonging to sub-group A_2 or even weaker types); with these the correct result can only be obtained by examining the serum. The higher salt concentration seems to prevent pseudoagglutination (formation rouleaux).

SUMMARY

Hæmagglutination (isoagglutination) with unheated serum or plasma is hastened and intensified in a high salt concentration. The cells for blood-grouping should therefore be suspended in 2–3% sodium-chloride solutions. A 2% solution is also suitable for use with heated sera, usually intensifying the speed and strength of agglutination. When unheated sera are used, a 3% solution is more effective although a 2% solution is generally successful. This procedure makes it possible to avoid the false negative reactions, caused by inhibition of agglutination or hæmolysis, which may occur in the examination of unheated sera in blood-grouping, particularly in cross-matching tests.

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PREVENTION OF HAMMER-TOE BURSITIS

KENNETH MCFADYEAN, M.R.C.S.

SPEAKING of foot problem in Service cases, Wood[1] said: "When an arthrodesis for hammer toe is done the man should be hospitalised and the toe splinted for no less than six weeks. I have seen several who were not, with disastrous results to the arthrodesis." Perhaps it is commendable in those with hammer toe that they suffer severely and repeatedly rather than accept a radical cure at the cost of six weeks idleness. Certainly they can find little solace in academic discussions on the evolution of the foot, and I therefore suggest the following simple measures of material relief which I have applied with complete satisfaction for over 20 years.

Most of the pain arises from attacks of acute bursitis in the small bursa which early develops over the head of the first phalanx. These attacks are almost always due to the friction of a new well-fitting shoe or of an old shoe which has become loose and a little out of shape. Anyone with a hammer toe should obtain a well-fitting shoe of standard type and a stock wooden tree, accurately fitting the selected shoe. Usually this can be found without going to the expense of having a tree made. Every other shoe of whatever weight, colour or style should be ordered from the same shop and made on the same last. Once the painful process of getting this new shoe to fit the hammer toe is over it need never be repeated. When the shoe is worn out, but before it has badly lost its shape, its tree should be inserted. A small nail should be driven through the centre of the convexity produced by the hammer toe on the upper of the shoe, to mark the tree. The tree should then be withdrawn and a small metal 'Dome of Silence,' accurately centred, should be hammered into the tree. Every new shoe should be stretched by this tree, first by itself and then for a further period with a thin sock and later with two thin socks covering the tree. Shoes must be bought three months before they are to be worn. After this treatment a new shoe can be worn the whole day without discomfort, except for foot tiredness due to the inflexibility of the new sole.

When this shoe gets old, stretched or a little out of shape, friction of the bursa will again arise. As soon as it does the base of the second phalanx should be covered transversely by three superimposed strips of elastic plaster, the layer next the skin being just over ½ in. wide, the second and third layers being progressively a little narrower. The elastic plaster should cover the extensor surface and sides of the toe. It need be renewed only once a week in spite of daily bathing. The only alternative to this treatment when a shoe is much worn is to discard the shoe completely.

1. Wood, H. L.-C. *Proc. roy. Soc. Med.* 1942, **35**, 193.

Medical Societies

ROYAL SOCIETY OF MEDICINE

AT a meeting of the section of Surgery on April 1, with Mr. ROCK CARLING in the chair, a discussion on

First Principles of Wound Treatment

was opened by Prof. R. S. PILCHER. The surgeon, he said, is an assistant of nature and his aim is to assist in the restoration of the function of the part in the shortest possible time. There are two obstacles to the recovery of function in a wounded part—the anatomical confusion due to the tissue loss and the presence of potential or established infection. In the present state of our knowledge, the prevention and control of infection in the traumatic wound necessitates neglect or aggravation of the injured tissue. Surgical repair and infection control are incompatible factors in wound treatment. Infection introduced before the case reaches the surgeon may be inevitable; that introduced afterwards is a reproach to the surgeon, and the skin and respiratory tract of the surgeon and his assistants are a most potent source of secondary infection. The Devenish and Miles report and the MRC memo (No. 6) have given ample evidence of this. The use of impermeable masks, particular care of the rubber gloves, and avoidance of direct wound handling are important controls. The surgeon who has operated with punctured rubber gloves for years with impunity may suddenly, if his skin becomes a carrier of pathogenic organisms, be faced with an outbreak of sepsis. Moreover, the cult of asepsis must be pursued and carried beyond the operating theatre to where wounds are exposed and dressed. The main weapon against infection is still the knife, and there is no justification for departing from the principles evolved in the last war, of removing dirt or dead tissue and draining the wound if infection is feared. Three points in such a toilet require emphasis. First, the skin is a viable structure and seldom needs excising in any quantity; this is a common fault in wound treatment. Secondly, the skin is elastic and seldom suffers as much as the deep structures; to deal with the deep structures, therefore, necessitates adequate enlargement of the skin hole. Thirdly, the divided muscles retract and carry contamination with them, making a complete wound excision often impracticable. With delay in treatment, the value of excision in the control of infection rapidly decreases. Great hopes now centre on the sulphonamides and surgeons are finding that they do diminish infection—with their use it is possible to do primary suture more often, and there are definitely improved results in compound fractures. But there is urgent need for further accurate information about the chemotherapy of wounds not only in war but in civilian injuries. The use of sulphonamides does not, however, warrant any relaxation of asepsis in the handling of wounds; dressings must be well fixed and not allowed to slide and traumatise the surface. Secondary infection is the main danger in an open wound and it is therefore important to close it as soon as possible. A large skin defect, as on the thighs, can be grafted immediately, at the primary operation. Wounds clean enough for closure, but where swelling or skin loss make it impossible, should be grafted at once. In the deep wound primary suture is obviously not advisable, but as soon as the surface is clean, with the aid of chemotherapy, early skin-grafting can be successfully undertaken even on an infected surface. The successful skin-graft is the best protection against further infection and it saves time and avoids contracture. In the early postoperative period, the most important measure is rest for the wound, for as long as it takes for the skin to heal and sometimes longer. That does not imply inactivity of the whole patient. It is when wounds occur in specialised regions, such as the hand, that rest is sometimes thought to be harmful. Stiffness of injured limbs following immobilisation is imperfectly understood and œdema is probably the most important factor. The proper control of posture prevents this, and it is the most important accessory to rest in the treatment of wounds, especially of the limbs.

Mr. F. W. HOLDSWORTH, of Sheffield, said the wounds of war are no different from those of the industrial accident—the pathology of the wound reaction is exactly the

same. Within a few hours granulating tissue starts to form, dead tissue is extruded, the gap is filled and the granulation tissue then becomes organised. The smooth course of this is often interrupted by infection. Bacterial contamination is at first very light and Mr. Holdsworth has found it difficult to cultivate any pathogenic organisms from the early wound. After a lapse of 24 hours the reverse is the case and heavy contamination almost invariably exists. In the depth of dead tissues organisms find their ideal medium and with the aid of body heat they flourish. The defence of the body depends entirely on the blood-supply. A wound which contains dead or dying material must therefore lead to heavy infection. There are two ways of dealing with this infection—to remove all tissues in the wound which lacking blood-supply possess no defence, and to destroy the initial infection by antiseptic solution. Excision of dead and dying tissue in the wall of the wound must be thorough and ruthless, and at the end of the operation the wound is left with a lightly infected wall with active blood-supply. But there is a difference in the treatment of the early and the late wound. In the late wound organisms abound in the dead tissue and a living wall of granulations is developing as a protective barrier between the slough and the living cells. To excise later is to operate at a time when organisms have multiplied in abundance, and any removal of the "barrier" is therefore particularly dangerous. But excess loose dead tissue must be removed. From 6 to 8 hours is considered the safe period for excision—from 12 hours onwards the preservation of the barrier is of utmost importance. In early or primary wounds excision must be thorough and a wide opening made to get access to the deep muscle. The operation often fails because of lack of ruthlessness. The principle must be extended to the whole limb if the blood-supply is gone. Since dead material is the source of infection, we must not introduce other dead material. Ligatures for spurting vessels, and sutures for main nerves in incised wounds, are the only exceptions. Bleeding must be arrested, and a collection of blood must be regarded as dead tissue; for this, firm pressure or drainage is indicated. Unless complete excision of the wound is possible there must be no primary suture; nor must this be done if the skin is under tension. Pack it open. Œdema-relaxing incisions may be necessary. It is doubtful if primary suture should ever be done in war. For late wounds complete and free drainage is essential and they must be packed lightly with soft paraffin and then immobilised. Rest is the essential of after-treatment and the recent work of Barnes and Trueta has shown the rationale and the importance of this. Plaster is the immobilising agent of choice although plaster itself is of no particular value. Persistent rise of temperature, heat over the plaster and pain are reliable indications of anything going wrong beneath it. The dangers of interference with circulation by the plaster are more apparent than real. It is rational to attempt to assist nature by the use of antiseptics to destroy the infection. If antiseptics are to be of use they must be used when bacteria are few. The antiseptic must be able to act in the presence of proteins, its action must be sustained, it must not interfere with phagocytosis or inflict further wound damage. In our present knowledge the chlorine and chloramine derivatives, acridine dyes, the sulphonamides and possibly penicillin are the only suitable ones. Mr. Holdsworth said he had entirely given up Dakin's solution as it certainly damages granulations. Because of their affinity for gauze, only 20% of the flavines ever gets into the wound. Penicillin may yet be available. In the sulphonamides we undoubtedly have a powerful weapon. In the past year he has lightly filled wounds with up to 10 grammes of sulphathiazole. In recent wounds results do not differ from those where none has been used, but in the delayed or infected wound results are strikingly satisfactory. Sulphonamides, however, are not an alternative to wound excision or drainage, which is still the fundamental principle of wound treatment.

Mr. W. McADAM ECCLES said that what was learned in the last 18 months of the last war still holds good. Let nature do all that she possibly can; the natural tissue of the body is the best antiseptic. Complete excision of devitalised tissue may not always be possible or necessary as in the through-and-through wound of the machine-gun bullet. By merely enlarging the opening of the entrance and exit wounds these cases do well.

Mr. C. H. S. FRANKAU urged the importance of debridement. The flavine dyes, because they stain devitalised tissue, are useful as a clue to any dead tissue left behind by the excision. The use of sulphonamides is an enormous advance but must not excuse us from full surgical treatment of the wound.

Mr. G. T. MULLALLY was impressed by the advice to use sulphonamides. He has hesitated to use them in any amount. The first results were not clear and the enthusiasm with which they were greeted was due to people who were not aware of the marvellous results obtained by excision plus drainage, with no antiseptics. He emphasised the importance of opening up the wound for excising it. The surgeon should not fear damage to the skin; there is little harm in a large incision but there is a great danger in leaving a wound imperfectly drained.

Mr. A. C. PERRY said the deep fascia is one of the structures which must be destroyed if adequate drainage is to be obtained. It may maintain considerable œdema.

Dr. J. M. BARNES thought that the "barrier" in its early stage could hardly be called granulation tissue, it is a fibrin layer. It is particularly delicate, easily torn by movement, and shows the extreme importance of complete immobilisation.

Mr. J. C. SCOTT, of Oxford, maintained that any suturing in war wounds is probably unwise. Immediate skin-grafting is very well for peace-time wounds but not for time of war. War-wounds are seldom seen early and certain differences of technique should be accepted. The aerial bomb splinter causes an enormous amount of destruction to the muscle under the skin, and that type of wound requires very wide excision. It takes nearly 3 weeks for an impenetrable granulation-tissue barrier to organisms to form; there is therefore some danger in changing plasters early. Sulphanilamide powder makes no difference in fresh wounds and he has found that sulphonamide-resistant streptococci are now beginning to appear in numbers. The great value of plaster is that it both immobilises and protects the wound. Provided the plaster is not soaked with fluid the bacterial flora underneath does not change. He always uses dry gauze for packing the wound. The blood is transmitted through to the plaster, and the gauze remains white. Blood-supply is the essential for fighting the infection.

Dr. J. TRUETA said that 12 hours is not the time limit for wound excision. He has excised wounds after 24 hours and even up to nearly 48 hours. If properly immobilised such wounds do well, and he has not had a single death with delayed excision. If not immobilised these patients die. If a limb wound arrives 24 hours late, there is great inflammation and it is difficult to know its limits; drainage only is advisable. But if the limit of the damaged muscle can be seen the way to aid nature is to excise it where seen. No war wound where muscle has been excised should be stitched up and it is important for the young surgeon to have this frequently pointed out to him. In Spain they had good results even before local sulphonamides. There are good results now with them but they must be regarded only as a complement to the surgical technique.

Colonel J. A. MACFARLANE, of the Canadian Army, said it is difficult to find the truth about the value of sulphonamides in wound treatment. The use of some sort of sulphonamide should be a routine prophylactic, but this in no way diminishes the necessity for urgent surgery as soon as the patient arrives at a proper centre. We owe much to Trueta for having rationalised and taught the principles of wound treatment and rest by plaster fixation. Sound surgery is still the sheet anchor of all treatment.

Mr. S. M. COHEN, from a series of over 300 casualties at the time of Dunkirk, had learnt how gratifying are results if the principles of surgery are observed. These were all late cases—over 24 hours old—and the treatment consisted in enlarging the skin wounds, dividing the fascia and removing only the tattered fragments of muscle or tendon followed by plaster immobilisation. Relaxation of the constricting fascial layer is of the utmost importance. No local sulphonamide was at that time employed but the convalescence and results have been most satisfactory, with no loss of life or limb. In the compound fracture sequestra and sinus formation are

still a problem and local suphonamide therapy would here be of much assistance.

The CHAIRMAN said that all reports indicate that in the treatment of the wound there is a tendency to do too much excision of skin which is neither dead nor lacking in vitality. There is also a tendency to feel that by using sulphonamides excision can be avoided. That is wrong, and there can be no better way of summarising the treatment of the war wound than by the words "lay it open."

Reviews of Books

Handbook of Communicable Diseases

FRANKLIN H. TOP, M.D., M.P.H., director, division of communicable diseases and epidemiology, Herman Kiefer Hospital and Detroit Department of Health. London: Henry Kimpton. Pp. 682. 37*s.* 6*d.*

TEXTBOOKS of infectious diseases—and the number is small—are mostly designed to cater for the limited needs of the student and the general practitioner. As such they are usually concise and clinical, and restricted to the prevalent fevers of the country. There is room for a more ambitious book, detailed in its treatment of individual diseases and with full discussion of epidemiological as well as clinical aspects. Top's book fulfils the first desideratum by including lymphocytic meningitis, psittacosis, trichiniasis, infections of the skin, tetanus, tularæmia, tuberculosis, venereal diseases, and a number of tropical infections, as well as the more common fevers; but it omits puerperal sepsis, glandular fever, infective and spirochætal jaundice, and gastro-enteritis. With such a wide field to cover, a number of the diseases have been dealt with briefly—though, from the clinical aspect, adequately. But epidemiology and laboratory methods in diagnosis have often been treated too briefly. Outstandingly good chapters are those on tuberculosis, leprosy, measles and poliomyelitis; pneumonia, often omitted in textbooks on fevers, is given 36 pages, and sulphonamide therapy and its toxic manifestations are ably reviewed. Scabies, pediculosis and impetigo are rightly included, though the author makes no distinction between the bullous impetigo of infants and impetigo contagiosa of older children. The intestinal infections, including undulant fever and trichiniasis, are given no more than 50 pages. The risks of serum disease in these days of refined sera are surely exaggerated, and there is no mention of TAF as a diphtheria prophylactic. It is useful to have definitions and interpretations of the terms used in epidemiology, and there are two chapters on the nursing care of the infectious case in the home and in the hospital, besides sections on the nursing of each individual infection. The public health-nurse as friend and counsellor to the family is obviously given an important place in America. There is little mention of modern views on cross-infection in wards or of measures for its control. The format, and the many illustrations, plain and coloured, are features which we in these days can but distantly admire.

A Modern Approach to Health Education

Ling Physical Education Association. London: University of London Press. Pp. 37. 1*s.* 6*d.*

THIS pamphlet, expressing the views of a committee appointed by the association under the chairmanship of Miss Helen Drummond, presents a practical scheme for health education throughout school age, and is therefore an important contribution towards post-war planning. Many now feel that their children enter adult life ill equipped with the knowledge on which to build a sound pattern of living. The committee insist on the link between personal hygiene and the health of the community; with this as a basis an appreciation of social conditions could be laid in school years, and this, by creating an intelligent demand for better opportunities of healthy living, might have far-reaching results. But the danger in applying any practical scheme for education in health, as a school subject, is that the emphasis laid on it may become too strong and too self-conscious. For example is it advisable to supplement routine training in the infant school with health talks and posters? The age-grouping is a little too young throughout the scheme; the junior school may have a keen curiosity, but it is surely more natural for a boy of eight to enjoy air as outdoor wind and weather, than to learn its composition and why he breathes it. Even a girl of eleven would not easily ask how we *take care* of our digestion, though she might like to be told roughly how it works. Pets and plants are encouraged, and it would probably be more natural if subjects like food, exercise and training were taught more by direct observation and where possible by handling of material until the last junior year, than by a rapid subjective approach. The scheme for teaching personal hygiene to children of eleven onwards is thorough and practical, and includes the care of babies. If the elementary school-child is to leave school and enter a working life at fourteen this knowledge is essential equipment, but it is hoped that one of the first post-war reforms will be the raising of the elementary school-leaving age, and if that happens a good deal of physiology could be shifted to a higher age-group. Possibly health education will teach us that a healthy child needs a long pre-scientific childhood.

The birthright of a child on a big country or farm estate was good because there was zest in his free exploration of nature, in his imaginative enjoyment of the seasons and his friendly understanding of animals. His home saw to it that he grew up sturdy, and behaved himself indoors. He absorbed home training and atmosphere, he didn't analyse it. When he was older he generally had the sense to see what this background had meant to him, and what shepherds, fishermen and woodcutters had told him he remembered, because they interpreted living facts in a living way. In other words, we should guarantee children a healthy life, not create health consciousness. Apart from inculcation, and a possible quick explanation, of good habits, the analysis of health in the junior school is our affair, not theirs. In the higher classes, after establishment of puberty, the subjects of the Ling scheme would seem an essential training part of any practical education in the art of living.

Law for the Medical Practitioner

D. H. KITCHIN, barrister-at-law. London: Eyre and Spottiswoode. Pp. 376. 15*s.*

IN the latest addition to the series of "Practitioner Handbooks," Mr. Kitchin brings within easy reach the legal information which every surgeon and physician ought to know. His preliminary chapter on the law and the law courts indeed might well be taught as part of every citizen's education. The other fifteen chapters deal with the medical practitioner's rights and duties, his possible responsibility to patients and third parties, his conduct if he has to enter the witness-box or to make a will or take a death-bed statement, and such varied medicolegal topics as mental disorder and deficiency, divorce and nullity, abortion and bastardy. There are useful pages on the business aspects of practice. He is not afraid to criticise the law he expounds, and he is among those who advocate a right of appeal to the High Court for practitioners found guilty of infamous conduct, though this reform might deprive the G.M.C. (and therefore indirectly the medical profession) of its exclusive control of professional standards. He would give the council a power to fine or to suspend a practitioner for a stated period. He regrets the inability to compel the attendance of witnesses, to administer the oath and to award costs. For lack of these powers he thinks the council is far too apt an instrument of private vengeance in the hands of professional rivals, vindictive ex-patients or jealous husbands. As he points out, these changes need legislation. Any bill which touches medical practice stirs up a mort of controversy.

The book is easy to read in spite of its compression; textbook writers can hardly be expected to keep pace with the defence regulations, or to mention every minor and temporary variation; otherwise the emergency relaxation of the cremation regulations, where death is due to war operations, might have been noted. No important case, ancient or modern, seems to have been overlooked. Readers who, with Mr. Kitchin's skilful help, inform themselves of all the traps which the law sets for the medical practitioner, will doubtless be the more ready to follow his wise advice about joining a defence society.

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THE LANCET

LONDON: SATURDAY, APRIL 18, 1942

VITAMIN A IN VEGETABLES

In 1937 the adult's requirement for vitamin A was assessed by a technical commission of the League of Nations at about 3000 IU a day. It was suggested that this intake could be assured by taking a pint of milk, one egg, an ounce of butter and a helping of green vegetable every day. Although no attempt was made at the time to differentiate between requirements for preformed vitamin A, which is purely an animal product, and for the vegetable pro-vitamin, carotene, these foodstuffs would contribute about 2000 IU of vitamin A together with 1000 IU of carotene. The war has greatly reduced supplies of dairy products, which are now available in generous amounts only for children and expectant mothers. The unprivileged adult receives no more than about 500–800 IU of preformed vitamin A daily. This includes the contribution made by margarine, which is vitaminised to a potency equal to about half that of good butter. Since commercial supplies of vitamin-A concentrates are probably too low to raise much hope of increased fortification of the margarine, and since we cannot all become cod-liver oil drinkers, the deficit in the intake must be made good by a greater consumption of vegetables. At first sight all that seems necessary is to raise the daily intake of carotene from 1000 to 2500 IU. But in fact we need an answer to several outstanding problems before we can estimate accurately the amount of extra carotene which will be required. Thus the biological experiments which have enabled us to express quantities of preformed vitamin A in terms of the international unit, which is based on carotene, have all been done with rats. There is evidence that in farm animals carotene is absorbed less completely than in the rat, and possibly the same may apply to man. In others words the unit of vitamin A, which for the rat has been fixed to be exactly equal to the unit of carotene, may for other animals be worth considerably more than a unit. It is of crucial importance, therefore, to decide whether the official estimate of 3000 IU for the daily human requirement should refer to vitamin A or to carotene. Moreover, most experiments on the relative activities of vitamin A and carotene have been made with oily solutions of the two substances. Can carotene be equally well absorbed from vegetable tissues, and if not how will the efficiency of absorption vary with different vegetables? How will cooking, mastication and the individual powers of digestion affect the issue?

Attempts to answer some of these questions have already been made by many workers, who have approached them from different angles. It seems plain that in the human subject carotene is less well absorbed from the intestinal tract than vitamin A, since the fæces contain no vitamin A, but usually large amounts of carotene. Experiments in which the efficiency of absorption of carotene has been placed as low as 1% may however be criticised on the ground of faulty methods of estimation. The available evidence suggests that the average efficiency may reasonably be taken as between 30% and 50%. Possibly a further loss may occur, reducing the total efficiency to about 25% in the case of man, when the pigment is converted to vitamin A after absorption from the intestinal tract. It follows that if the official estimate of the requirement as 3000 IU was intended to refer to preformed vitamin A, it must be multiplied two to four times to be equivalently expressed in international units of carotene. If on the other hand it was intended to express the requirement in terms of carotene, the figure 3000 IU should be divided by between two and four when it is desired to express the requirement wholly in terms of preformed vitamin A.

Whatever the ultimate solution of this intricate problem, it does not affect the fact that during the remainder of the war we must rely on vegetables to supply the bulk of the national requirement of vitamin A. Under these circumstances the evaluation of the requirement in terms of preformed vitamin A becomes much less important than its assessment in terms of carotene, and particularly in terms of carotene as usually eaten in cooked vegetables. Such information seems particularly desirable in regard to the carrot, which must be reckoned as our main source of carotene on a large scale. Its gross carotene content, as estimated by chemical tests, is usually about 20,000 IU per 100 g., which means that even with very inefficient absorption the carrot must be a valuable source of vitamin-A activity. Other vegetables, including spinach and broccoli tops, may be almost as rich, but they are available in smaller quantities over a shorter season, crop less heavily and cannot be stored. By the successful planning of the Ministries of Food and Agriculture adequate supplies of carrots were produced last year, and with an equal crop this season about ½ lb. per week per head of the population should be available throughout the year. Even though we do not know the exact requirement, efforts should be made to encourage everyone to consume this weekly share of half a pound as a safeguard to their health. The need for this must be frankly explained to the public. It is not enough merely to say "Eat more carrots," for this slogan will arouse no response in the indifferent and in those who do not like carrots; the public must realise that since they can no longer get their pint of milk, egg and ounce of butter they must make up with carrots, helped out with vitaminised margarine. The campaign to introduce new and attractive ways of cooking carrots is a valuable step in this direction. There seems little point, however, in making particular efforts to boost the raw carrot. The carotene is not destroyed by cooking, and only small amounts of the heat-labile vitamins B_1 and C are present in the roots even when raw. There is evidence, too, that cooking increases digestibility, with a corresponding increase in the efficiency of absorption of the carotene.

COMMISSION AND OMISSION

Even before the outbreak of the present war the Medical Women's Federation had been in fruitless correspondence with the War Office regarding the status of medical women who might be invited to serve with the land forces. They were then told that in the event of another war no women doctors would be wanted in any capacity by the Army. But when the war came women doctors were asked to volunteer

and were offered "relative rank" in the RAMC (and later in the medical branch of the RAF) with status, salary and allowances similar to those of their men colleagues. This was accepted as reasonably satisfactory. When, later on, the Government decided to grant commissions to other women in the forces, including nurses, it was considered that women doctors must also have commissions of some sort. The obvious and natural thing would have been to give them commissions in the RAMC, for which service they had been recruited. Whitehall set its face resolutely against this, ostensibly because of some vague legal difficulty, and because women should not be asked to discipline men or to fight. Eventually commissions were offered to women for service *with* the RAMC and RAF (medical branch), but not *in* these services. Such commissions are not equal to those held by men because they give women a status definitely lower than men of equivalent rank.

The grudging attitude of the Whitehall authorities is difficult to understand. Presumably women doctors are needed by the Army or they would not be asked to volunteer in considerable numbers. And if they are needed it is ungenerous to offer them conditions of service which necessarily lower their professional position. Many of the young medical women who have been recruited have probably accepted the conditions offered without much thought, but the fact that they are satisfied with their work is no excuse for an insistence on professional inequality based on a theoretical difficulty as to combatancy. The likelihood that a medical woman might find herself suddenly called on to take command (say) of a hospital unit, because her superior officers were killed or absent, is remote, especially having regard to the relatively small number of women doctors and the kind of work they are doing; although in modern fighting no situation can be ruled out, and any day a woman may find herself in a tight corner and be called on to face dangers and assume responsibilities which were certainly not contemplated as part of her medical duties.

No wonder medical women are wounded at the refusal of the authorities to recognise their claim for equal treatment. The accepted principle of professional equality has been ignored and women doctors are left in an indefinite and unsatisfying position, attached to one service but actually belonging to none. The fact that the younger women doctors are in future to be conscripted makes it irrational that they should not be offered conditions similar to those offered to medical men. It is for the medical profession as a whole, and women doctors in particular, to protest firmly against this discrimination. The Medical Women's Federation proposes (p. 487) that for the present women doctors, while accepting "relative rank," should not accept commissions in the women's forces.

THERAPY OF GONOCOCCAL INFECTION

GONOCOCCAL infection is usually confined to a local invasion of the mucous membrane of the lower genito-urinary tract, but the invading organisms may penetrate deeply before the defensive forces stabilise the front, often assisted by such fifth-columnists as alcohol, physical exertion and further sexual excitement. Treatment acting through the blood-stream should thus enjoy an advantage over purely local measures and the sulphonamides act in this way. Theoretical considerations also indicate that a potent chemotherapeutic drug should be given in doses big enough to ensure the rapid attainment and maintenance of the optimum blood level of its active constituent. Furthermore, the help that local measures can contribute is largely of a mechanical nature only, and unless innocuous to the infected tissues they may be better withheld. Growing experience of the chemotherapy of gonorrhœa has led to a widening appreciation of these principles and a scientific approach to treatment is now more, and not less, important than before the introduction of these drugs.

Sulphapyridine has proved its superiority over the earlier sulphanilamide preparations and experience is now sufficient for its value to be assessed. It is of inestimable value in the treatment of gonorrhœa in Service cases, and the wastage of man-power from this disease in the present war contrasts favourably with that during the last. The treatment of Service cases in hospital has encouraged the use of intensive dosage along the lines first reported by BOWIE and his colleagues.[1] In such courses[2] about 22 g. of sulphapyridine is given in 48–72 hours but the results recorded are no better than those obtained with more moderate dosage. On another page FAIRBROTHER, AYMER and ASHTON report that large doses do not produce proportionately high blood levels, that clinical cure may be achieved in some cases in which the blood sulphapyridine level is low, and that failure may occur in the presence of a high blood level. LAIRD claims that a high fluid intake and urethral lavage are of value in reducing the number of failures, the time for clinical cure, the relapse-rate and the incidence of acute complications during and following chemotherapy. Some of this experience in Service cases is applicable to outpatients, in whom one 0·5 g. tablet of sulphapyridine four-hourly or the 2.1.1.2 daily tablet scheme constitutes a satisfactory regime for those who must continue at work. Hæmaturia may develop in cases receiving the larger doses of sulphapyridine,[3] and the importance of a daily fluid intake of at least five pints cannot be overstated. Vomiting is sometimes troublesome, and being central in origin may be favourably influenced by bromides given before and during chemotherapy. Agranulocytosis is rare, especially when the drug is limited to 30 g. given in less than ten days. In the female sulphapyridine is equally successful. A dosage of 0·5 g. four times a day or even four-hourly gives excellent results and is well tolerated by outpatients.[4] Chemotherapy should begin as soon as a diagnosis is made and continue until about 20 g. has been administered. Whenever possible it should be combined with rest during the first menstrual period to prevent extension of the infection to the pelvic organs. Local treatment is usually unnecessary, and, apart from a daily hip bath followed by powder, should be discouraged. Bartholinian abscess and salpingitis subside rapidly without local interference but infection of Skene's ducts requires local cautery. *Trichomonas vaginalis* infection is uninflu-

1. Bowie, F. J. T., Anderson, T. E., Dawson, A. and Mackay, J. F. *Brit. med. J.* 1939, i, 711.
2. King, A. J. and Williams, D. I. *Brit. J. vener. Dis.* 1941, **17**, 202; MacKenna, R. M. B. and Wordingham, R. T. *Ibid*, p. 222.
3. See Laird, S. M. *Lancet*, 1941, ii, 272; annotation, *Ibid*, p. 646.
4. Moffett, M. *Brit. med. J.* 1940, ii, 8; Rawlins, M. *Brit. J. vener. Dis.* 1940, **16**, 232.

enced by the sulphonamides and its presence should always be excluded in gonorrhœa cases in which sulphapyridine fails to abate the discharge. Chemotherapy has changed the outlook in vulvovaginitis in children and is superior to œstrin, being being free from its undesirable side-effects. As in adults local treatment is contra-indicated except for the hip bath and powder. Relapse may occur, and long observation using cultural methods is therefore still required. The period of initial hospitalisation and exclusion from school, however, is much less than was formerly necessary.[5] Ophthalmia neonatorum, gonococcal and otherwise, has also lost its former terrors. SORSBY and his colleagues[6] have reported brilliant results from oral sulphapyridine in 273 cases. Full dosage should be used and local treatment by irrigation with 0·5% saline followed by instillation of liquid paraffin is seldom necessary after the first day. Corneal ulceration responds rapidly and seldom occurs after chemotherapy has been begun. When it is present 1% atropine sulphate drops should be instilled thrice daily. Preliminary reports indicate that sulphathiazole and sulphadiazine are at least as effective as sulphapyridine in the treatment of gonococcal infection and are more free from troublesome side-effects. That a true "therapia sterilisans magna" may yet be achieved is foreshadowed by the reports of MIESCHER[7] and RAMEL.[8] MIESCHER systematically progressed from a six-day treatment to a one-dose administration of sulphathiazole without adjuvant treatment, the single dose varying from ten to four 0·5 g. tablets. The results claimed were excellent and it is possible that the lime-blossom tea, used to wash down the powdered tablets, favoured absorption of the drug by reducing gastric acidity.

Failure to respond to chemotherapy is most often due to a "closed" focus of infection and the discovery and local treatment of all such foci are essential. Drug resistance may explain some of the failures but the possibility of failure of the patient's own immunological response to infection should be kept in mind. It seems probable that the benefit which may follow intravenous TAB vaccine results more from stimulation of the patient's reticulo-endothelial system than from any direct action of the induced pyrexia on the organisms. While chemotherapy is most successful in uncomplicated gonorrhœa it is highly effective also in epididymitis, peri-urethral abscess, acute posterior urethritis, bartholinian abscess, salpingitis, iritis and conjunctivitis. It is often disappointing in acute arthritis and tenosynovitis and seldom of value in chronic arthritis and keratodermia blenorrhagica. Its success in the metastatic complications depends on the skilful use of all available measures directed to the elimination of the primary focus of infection. In such cases pyretotherapy, using the Kettering hypertherm, therapeutic malaria or intravenous TAB vaccine often produces striking results. While the treatment of gonorrhœa has thus been revolutionised the assessment of cure still demands adequate observation and stringent tests, including the more widespread use of cultural methods. The rapid abatement of symptoms has led to an increased defaulter-rate in clinic practice, and the apparent simplification of therapy has encouraged the treatment of gonococcal infection by practitioners insufficiently equipped to carry out proper assessment of cure. Unless these tendencies are overcome the epidemiological position of gonorrhœa in this country may become worse than it was before the introduction of chemotherapy.

5. Rice, J. L., Cohn, A., Steer, A. and Adler, E. L. *J. Amer. med. Ass.* 1941, **117**, 1766.
6. Sorsby, A., Hoffa, E. L., Smellie, E. W. *Brit. med. J.* 1942, **i**, 323.
7. Miescher, G. *Schweiz. med. Wschr.* 1940, **70**, 891.
8. Ramel, E. *Rev. méd. Suisse rom.* 1940, **60**, 602.

Annotations

THE BALANCE OF SEX

THE minds of many of us, as Lake[1] has remarked, revolt from the thought that anything in man's body may be ill-designed or imperfect, preferring to believe that all disease must be the result of noxious attack from without. In this mentality there is something of the Hitlerian creed. Others carry the fallacy a step further and seek to find in bodily ills or malformations an excuse for sickness really of the mind. A few years ago it was fashionable to explain away all psychology in terms of the internal secretions of "the glands of destiny." Shelley's genius depended on his thyroid and Byron's on his gonads. Had not physiology intervened, opinion might have slipped back three hundred years and replaced the soul in the pineal. As in many fads, there was a grain of truth in this. The sensations of fear, apprehension and anxiety may be reproduced by the injection of adrenaline. The hyperthyroid patient is excitable or even maniacal. Hypertrophy of the adrenal cortex may give to a previously normal girl not only the look but the outlook of a man. The end of gonadal secretion may turn a placid and affectionate woman into an irritable termagant or an energetic and cheerful man into a melancholy sluggard. These changes occur through alterations in the concentrations of substances which normally bathe every somatic cell and are therefore correctly regarded not as new conditions brought about by external attack but as exaggerations of changes which take place from day to day unnoticed in the normal person. There is so much of the female in the most masculine of us and so much male in the most feminine that it ill behoves any to speak ill of the intersexual. That homesexuality is usually psychologically determined seems certain, but the cells of all of us are bathed in both œstrogens and androgens, and we need not turn to the hermaphrodites to find the results of quantitative imbalance. Draper[2] has pointed out that in a male ward the neat, quiet placid patient is conspicuously rare, and in a female ward the restless dominant woman. The former is often found to have a suggestion of a feminine physique, the small muscles, and the fat-determined contours of the girl, whereas the latter may have much of the man about her, the deep voice, powerfully moulded forehead and prominent jaw. Geddes and Thompson[3] have put the same thought less pictorially by saying that femaleness is correlated with preponderant anabolism, maleness with emphatic katabolism, a view supported by the fact that the average basal metabolic rate of women is lower than that of men.

Most textbooks of medicine begin the description of a disorder with a statement of its relevant frequency in the two sexes, but few readers stop at this point to consider its significance. A scale can be constructed of the sex-incidence of diseases and the one published by Draper ranges from gout (98% males) and Marie-Strümpell spondylitis (91% males) at one end to hyperthyroidism (91% females) and Heberden's nodes (97% females) at the other. At the extremes, metabolic factors in general and endocrine ones in particular, or social usage (alcoholism, 84% males) may give a hazy notion of the underlying cause for these great differences of distribution, but in the middle of the nosographical spectrum the explanation

1. Lake, N. C. *Brit. med. J.* 1942, **i**, 31.
2. Draper, G. *New Engl. J. Med.* 1941, **225**, 393.
3. Geddes, P., Thompson, J. A. The Evolution of Sex, London, 1901.

is more obscure. Why, for instance, are 67% of cases of whooping-cough female and of chronic glomerular nephritis male? Why should duodenal ulcer be predominantly male (83%) while gastric ulcer takes an almost middle path (57% male)? As Draper says, such charts have been constructed on the view that men are men because they have testicles and women women because they have ovaries. "The concept of non-genital androgyny has not been introduced. Yet the very nature of the shifting curve apparent in the chart, which moves almost continuously from one sex predominance to the other, suggests a susceptibility gradient rather than two diametrically opposed sex types." He suggests that often the patients with a disease commoner in the opposite sex show on careful examination physical attributes inappropriate to their own, and quotes Motley's picture of Margaret of Parma, "with her imperious temper, her masculine appearance, her moustache and her gout." This suggests a new ward game, in which marks are given for various andric and gynic qualities in the patients other than the sex of their gonads. Their sex would thus be represented not as M or F, but as quantities to the M or F side of the isosexual point. If the sexual chart of disease is afterwards reconstructed, will we find that all disorders achieve the admirable impartiality of pernicious anæmia, which, even on the rough criteria of the gonads, affects the sexes with equal frequency?

PROGNOSIS IN STAPHYLOCOCCAL SEPTICÆMIA

STAPHYLOCOCCAL septicæmia has a case-fatality which varies in different series from 60% to 90%, if osteomyelitis with positive blood-culture is excluded. In recent years claims for the therapeutic value of staphylococcal antitoxin, bacteriophage and the sulphonamides, particularly sulphathiazole, have been made either because of apparent success in isolated cases or from an improved fatality-rate in comparison with a series of untreated cases in preceding years. Unfortunately there are few reliable criteria for prognosis in staphylococcal septicæmia. McLellan and Goldbloom[1] believe that increasing interest in new therapies has led to the discovery of a greater number of mild cases through more frequent blood-culture, with a resulting unjustified optimism about the worth of these remedies. For example, in their own experience the case-fatality was 80% among 15 cases in 1933–36, when the ratio of blood culture to total admissions was 1 : 32·9, whereas it fell to 50% among 28 cases during 1937–40 when the corresponding ratio was 1 : 22·9. They attribute cure of only 2 of their cases to specific treatment. They suggest as favourable prognostic guides of some value a history of antecedent localised staphylococcal infection or a coexisting local lesion, and a low colony count from the blood-culture. Among their cases which survived, 9 out of 16 had some evidence of previous or coincidental localised skin infection; among 17 patients who died only 6 had a local lesion, of whom one probably died from a massive dose of intravenous antitoxin, while 2 others survived for 68 and 86 days. Superficial abscess formation in a generalised staphylococcal infection has, in the experience of others, been a favourable prognostic sign, and it is a question whether the fixation-abscess should not be induced more often in staphylococcal septicæmia, for experimentally it has been found to save the lives of mice with streptococcal septicæmia. On the other hand, some surgeons believe the local lesion should be excised to prevent continuous seeding into the blood-stream from this septic focus. As regards blood-culture, a quantitative colony count should be a routine procedure in all cases of suspected septicæmia; 1 c.cm. of blood can be added to melted agar and poured into a plate at the bedside, or the blood can be taken into 'Liquoid'[2] and the different media inoculated at leisure in the laboratory. Irregular bacteræmia is to be found in cases of carbuncle or other localised staphylococcal infections which should not therefore be regarded as true septicæmias. It is difficult in staphylococcal infections to draw a dividing line between bacteræmia and septicæmia, but any case with 5–10 organisms in 1 c.cm. of blood on two or more occasions should be included in the septicæmic group. McLellan and Goldbloom regard a colony count of 20 or over per c.cm. as a bad prognostic sign. Of their 16 surviving cases only 2 had counts over 20 organisms per c.cm. whereas all but 4 of the 17 fatal cases had counts varying from 20 to 500 or more; of the 4 exceptions, 3 had initial colony counts of 1, 17 and 19 and the last case died before blood-culture could be done. They give a useful review of reported cases, which support their contention that a local lesion and a low colony count together or independently are reasonably reliable guides for a good prognosis in staphylococcal septicæmia, and it may be hoped that other workers will use these criteria when recording the results obtained with the newer remedies. In both of the cases reported on another page by Flowers and his colleagues the infection became localised in a bone, and in both the colony counts were in the neighbourhood of 10 per c.cm. The prognosis may, then, have been less desperate than the patients' clinical condition suggested. Nevertheless, these cases demonstrate that sulphathiazole can be pushed much beyond the generally accepted limits of safety, even if such toxic reactions as drug fever and rashes appear—it is for the clinician to decide whether the toxicity of the drug or of the infection is the more dangerous. These patients received 232 g. and 169 g. of sulphathiazole, and both survived. Long and Longacre,[3] in a small experimental and clinical study, demonstrated that cases of staphylococcal septicæmia can be divided into those whose plasma-protein levels rise to normal or above with treatment and who will recover, and those in which the levels remain subnormal. They emphasise the value of large transfusions of whole blood or plasma. A high antitoxic immunity is valuable in localising experimental infections,[4] and further trial might be made of very large doses of antitoxin—20,000–40,000 units intramuscularly followed in 4–6 hours by 40,000–60,000 units intravenously—as recommended by Baker and Shands[5] who found the Arneth count a help in assessing the need for and value of antitoxin therapy.

FOOD TO WORK ON

"CANTEENS," we say, "are the thing," feeling in our enthusiasm that all is well: industrial workers will now be capably fed. But a comprehensive and effective canteen system is not set up in a moment. In an inquiry[6] into British war production Mass-Observation reviews the feeding of workers at its present stage of development. Canteens are now obligatory in large firms doing munition work, but many firms have undertaken the task reluctantly and inadequately. Thus one managing director complained bitterly that since the canteen had been opened his workers knocked off early in order to be able to make a dash to it as soon as the lunch hour struck; his firm employed 2000 workers and provided canteen facilities for 300. A few firms take a pride in their canteens. Small firms are not obliged to provide canteens, and when resources and premises are limited it is sometimes beyond their power to do so; but where such a firm is placed in a remote country district, lack of a canteen means considerable hardship. Since

1. McLellan, N. W., Goldbloom, A. *Canad. med. Ass. J.* 1942, **46**, 136.
2. Roche Products. Sodium polyanethol-sulphonate. See Penfold, J. B., Goldman, J. and Fairbrother, R. W. *Lancet*, 1940, **i**, 65.
3. Long, C. H. and Longacre, A. B. *Surg. Gynec. Obstet.* 1942, **74**, 353.
4. Downie, A. W. *J. Path. Bact.* 1937, **44**, 573.
5. Baker, L. D., Shands, A. R. *J. Amer. med. Ass.* 1939, **113**, 2119.
6. Part I—People in Production. London: Advertising Service Guild. 10*s*.

well over nine-tenths of the country's factories employ less than 250 workers, and since nearly half the workers in the country are employed by small firms, the need for more canteens, or for some alternative plan, is not trivial. It seems that nearly all new factories plan for canteens from the outset, and two-thirds of the large firms now have effective ones; according to an official estimate, factory canteens are now being opened at the rate of 100 a month; in July, 1941, the total number had reached 4000, but there seems to have been no full count since. Shortage of qualified staff, of equipment and cutlery, building difficulties where premises are not available, and the conviction of some business men that a canteen *must* be run at a profit have all helped to check progress. Yet the inquiry quotes the statement of the Engineering Industries Association that by installing a canteen one firm saved £12,000 a year on time previously lost through workers preparing snack meals at the bench.

Besides saving time and trouble for workers a good canteen, of course, should supplement diet and thus help to maintain health. No reliable statistics seem to be available about the effects of diet on work, but the Oxford Nutrition Survey is undertaking a study. The inquiry quotes a welfare manager who found that during the heavy snowfalls early this year a girl of nearly 15, who lived 4½ miles away from the factory, was walking to work and arriving before 8 every morning; she said that she knew if she could get to work she would be sure of her dinner—which suggests that in her case, at least, diet and work were closely bonded. Where canteens are not to be had British restaurants sometimes supply the deficiency, but they are mostly in the middle of towns, and since they make no discrimination among customers, workers may not be able to get fed there in time. Moreover the supply of these restaurants is still below the demand; by the end of 1941 there were 1207 special feeding centres in Great Britain, of which only 517 were British restaurants in the strict sense, the others being evacuee centres, centres provided by local authorities on their own responsibility, voluntary organisations, centres set up during raids and Londoners' Meals Service centres. The public are enthusiastic about British restaurants, but the caterers oppose them. Since, however, commercial catering has not been able to meet the demand, and since Mass-Observation finds that 96% of people who have eaten a meal in a British restaurant like it, there seems good reason for putting these convenient war-time centres within reach of workers who need them, especially since this is a matter affecting production as well as health. Lord Woolton has assured caterers that before any more British restaurants are opened the Ministry of Food will consult the trade; he might go further, and say that before any plan to open a British restaurant is turned down he will consult the workers.

THIRD SUPPLEMENT TO THE BPC

SINCE the war started there have been two supplements to the British Pharmaceutical Codex 1934, one on surgical dressings and the other containing new formulæ. The third and largest supplement,[1] now issued, contains 80 new monographs or submonographs. They include substances which have received official recognition in the four addenda to the BP 1932, but also many others, the most notable perhaps being sulphapyridine and sulphathiazole. Standards are laid down for non-pharmacopœial substances and the BP standards are summarised. There is the usual informative summary of actions and uses for each substance, BP or otherwise. Many of the newcomers were once imported but are now manufactured here under the provisions of the 1939 patents legislation, and for these the names suggested by the Therapeutic Trials Committee have been adopted throughout. In future we can write BPC after:

Acetomenaphthone (vitamin-K analogue), amphetamine, amphetamine sulphate ('Benzedrine Sulphate'), cetyl alcohol, chloroxylenol (antiseptic), solution of diodone, diphenan ('Butolan,' 'Oxylan'), dithranol ('Anthralin,' 'Cignolin,' 'Derobin'), anhydrous ephedrine, menaphthone (vitamin-K analogue), mesulphen ('Mitigal,' 'Sudermo'), methyl hydroxybenzoate (preservative), aromatic oil of pine, phenytoin soluble (sodium diphenylhydantoinate, 'Epanutin,' 'Eptoin,' 'Solantoin'), progesterone, propyl hydroxybenzoate ('Nipasol M,' preservative), raspberry leaf, ricinoleic acid (constituent of bactericidal soaps), sphagnum, stilbœstrol, staphylococcus toxoid, sulphacetamide ('Albucid'), sulphapyridine, sulphathiazole, terpineol (aromatic antiseptic), testosterone (an androgen), testosterone propionate (the same but more soluble in oily media), and tocopheryl acetate (vitamin-E analogue).

Many of these are still most familiar by their proprietary names, and it would have helped rather than hindered the general adoption of the official nomenclature if these could have been added in each monograph. This defect is partly corrected by the revision of Appendix XIV in this supplement, which gives the composition and brief particulars of proprietary preparations, but only works one way. The Latin tables are, of course, retained and must be until the whole BPC is revised. Their continued use in everyday prescribing must be blamed on the handiness of their shortened form. Many of us would be doubtful of the terminations of histaminæ phosphas acidus, yet would cheerfully order histam. phosph. acid.

1. Third Supplement to the British Pharmaceutical Codex 1934. Part I—Monographs, 1942. London: Pharmaceutical Press. Pp. 101, 5s. 6d.

DOUBTS ON VITAMIN K FOR THE NEWBORN

THE story of lowered prothrombin values in the blood of newborn babies, hæmorrhagic manifestations and the use of vitamin K or its chemical analogues in prevention and treatment sounded too simple for many pædiatricians, and they have been patiently waiting for further evidence or collecting it for themselves, like H. N. Sanford, Irene Shmigelsky and Josephine M. Chapin of Bush Medical College, Chicago. These workers now report[1] what is essentially a failure to establish a satisfactory relationship between the first two conditions named above and throw considerable doubt on the value of the third. Briefly they studied prothrombin levels in the cord blood and venous blood withdrawn for at least five consecutive days after birth in 711 infants given vitamin K either directly or in a small number of instances indirectly by giving this substance in synthetic form to the mother before the birth of the baby. Similar studies were made on a control group of 982 newborn babies receiving no vitamin K. The now familiar results were obtained—a drop in the control group of blood prothrombin on the third day of life to low levels whereas in the indirectly protected infants the drop was much less severe and in the directly protected babies even less. So far this is on orthodox lines but the Chicago workers introduce the element of doubt when they compare hæmorrhagic manifestations in the two groups.

Type	Untreated infants (982)	Per cent.	Infants given vitamin K (711)	Per cent.
Conjunctival	21	2·1	12	1·7
Vaginal	11	1·1	8	1·1
Cephalhæmatoma ..	7	0·7	5	0·7
Petechial and ecchymosis	6	0·6	6	0·84
Cerebral	5	0·5	4	0·56
Hæmatemesis	5	0·5	4	0·56
Umbilical	5	0·5	3	0·42
Circumcision	3	0·3	3	0·42
Melæna (bowel) ..	3	0·3	2	0·29
Total	66	6·6	47	6·59

Discussing these surprising results in more detail they point out that there was no correlation between pro-

1. *J. Amer. med. Ass.* 1942, 118, 697.

thrombin level and hæmorrhagic tendencies. The mortality-rates in the two series were identical and among premature infants there were 7 deaths in each group out of 45 control and 48 vitamin-K treated infants respectively. It is clear that enough vitamin K was given, for the usual results on the blood prothrombin were obtained. The Chicago pædiatricians say that the explanation for these results must lie in two directions. "Either we do not know what hæmorrhagic disease is, or there is a marked difference in our newborn babies as compared to other localities." The latter possibility raises questions of maternal diet, seasonal incidence and other problems which can be summed up in the possibility that careful antenatal care may play a part in preventing hæmorrhages in the newborn. This point is capable of statistical study and could be quickly settled. The former possibility is, of course, the crux of the matter. It is palpably absurd to lump all hæmorrhagic manifestations of the newborn together and pretend that this is a "hæmorrhagic disease" due to prothrombin deficiency and preventable and curable by giving vitamin K. Whatever the facts as regard adult prothrombin levels and hæmorrhages may be the problem in the newborn is not so simple, and the Chicago workers have done well to introduce the necessary element of scientific doubt into what was threatening to become almost a simplified romance, with disappointment round the corner for those who pinned their faith to vitamin K to the neglect of other factors.

BLOOD IN THE STOOLS

In those medical emergencies characterised by bleeding into the alimentary tract it is important for the clinician to know how much significance can be attached to the appearance of blood in the stools. L. Schiff, R. J. Stevens, N. Shapiro and S. Goodman[1] have tried to clarify matters by giving citrated blood by mouth. Their experiments fall into three groups. In the first they determined the amount of blood necessary to produce a tarry stool—defined as "a glistening stool having the same black colour as found on a standard paint colour chart." Citrated venous blood, two to three weeks old, was mixed with soda-water (100–200 c.cm.) to disguise the taste and given by mouth to three normals and fifteen ward patients. A normal diet was allowed and drugs known to discolour the stools were prohibited. The amount of blood was varied in quantity and it was found that at least 100 c.cm. of blood was necessary to produce a tarry stool—or to put it the other way round from the practical standpoint—a tarry stool may result from as little as 100 c.cm. of blood. The second experiment was concerned with the time of appearance of bloody or tarry stools after intragastric administration of citrated blood. The blood was three weeks old, from a blood bank, and was given at room temperature by stomach-tube in quantities of 1000–2000 c.cm. The smaller quantities were allowed to flow in by gravity during a period of thirty to sixty minutes. The large amounts were given in divided doses of 700, 700 and 600 c.cm. at four-hourly intervals. An injection of codeine sulphate, gr. 1, and atropine sulphate, gr. $\frac{1}{150}$, was given hypodermically before the blood to prevent too rapid passage through the alimentary tract. Despite this measure, blood appeared in the stools within four hours and a patient's stools might be entirely bloody and were tarry after intragastric administration. Neither the appearance—bloody or tarry—nor the number of bloody or tarry stools was directly related to the quantity of blood given. None of the subjects vomited the blood. Bloody stools may be passed for as long as three days and tarry stools for as long as four days after a single draught of blood. Thirdly, experiments were performed to determine the duration of a positive test for occult blood in the stools after oral or intragastric administration of citrated blood. After a single large dose of blood the stools gave a positive test for as long as fourteen days; all the patients were of course kept on a meat free, vegetable-free diet during the tests and had a preliminary negative test for occult blood in the stools. From these observations it seems that a tarry stool does not necessarily indicate a severe hæmorrhage into the digestive tract and that the persistence of tarry stools or occult blood does not necessarily indicate the continuation of such hæmorrhage.

1. *Amer. J. med. Sci.* 1942, **203**, 409.

SURGERY AT PEARL HARBOUR

On Dec. 3 Dr. J. J. Moorhead of New York arrived in Honolulu at the invitation of the local medical society to deliver a series of lectures on the principles of traumatic surgery. Four days later, now acting colonel in the Army Medical Corps, he found himself supervising the application of these principles in treating the victims of the attack on Pearl Harbour. He describes[1] the inevitable confusion caused by the influx of a large number of casualties; but soon eight operating teams were on duty and worked continuously for 11 hours, after which regular 6-hour shifts were organised. The numerous and varied casualties consisted largely of the multiple lacerated wounds and compound fractures which have made up the bulk of air-raid casualties here, and treatment was on familiar lines. Initial morphine and blood- or plasma-transfusion were followed by cleansing, moderate excision, local sulphathiazole, and, when possible, delayed primary suture; primary suture was never employed and closed plaster was applied only for minor compound injuries. Moorhead found very useful for the localisation of metallic foreign bodies the radio-frequency probe which has been used by the Germans in this war and described in these columns[2]; this is an electromagnetic induction apparatus which registers the surface-position and depth of the fragment and gives audible warning when it is approached by a metal probe. In one case, with a bullet lodged in the spinal canal, this instrument provided the only means of successful extraction. Another dramatic procedure was the removal of intrathoracic fragments under the radiographic screen by means of a long clamp introduced through a stab intercostal wound; this, perhaps, will not be universally approved though it was found to give gratifying results. Summing up the lessons learned at Pearl Harbour, Moorhead emphasises the low operative mortality of 3·8%, the almost complete prevention of suppuration and the absence of deaths from gas-gangrene, and the excellence of the late results. All of these were in striking contrast to experience in the first World War, but circumstances were particularly favourable. The wounded were received within 6 hours, preliminary treatment for shock was available and climatic conditions were excellent; the standard of surgical skill was high and aftercare was adequate and continuous. The results demonstrate the value of a careful and preconceived plan of treatment.

1. Moorhead, J. J. *J. Amer. med. Ass.* 1942, **118**, 712.
2. See *Lancet*, 1941, i, 699; Farmer, F. T. and Osborn, S. B. *Ibid*, 1941, ii, 517.

As part of the Ministry of Health's policy to make the Central Council for Health Education the sole body responsible for popular health education in England and Wales, last week the Central Council took over educational work for the prevention and treatment of venereal diseases hitherto undertaken for local authorities by the British Social Hygiene Council. The BSHC will continue as a voluntary organisation and carry on with its colonial and international work on the control of venereal disease and the social implications of these diseases in Great Britain. It will concentrate on problems of social biology, including preparation for marriage, the adjustment of personal problems and the application of present knowledge of the biological sciences to social problems of today, particularly those related to the war effort. The BSHC may be addressed at Tavistock House South, Tavistock Square, London, W.C.1.

Special Articles

CONTROL OF RICKETTSIAS
IMMUNISATION AGAINST INFECTION

G. W. M. FINDLAY, C.B.E., SC.D.

LITTLE has so far been learnt of the control of rickettsial infections either by chemotherapeutic or specific treatment. No human rickettsiases appear to be influenced in any way by members of the sulphonamide group of drugs although Nietz (1939 and 1940) has found that *R. ruminantium*, the causal agent of heart-water can be influenced in sheep by injections of 'Uleron' (Bayer), while *R. canis* infections in dogs can also be cured by sulphanilamide. Injections of immune or hyperimmune serum given during the incubation period or during the first few days of the illness have been found by Weigl (1937) and others to abort or curtail the infection. Hyperimmune sera prepared in the horse and rabbit are possibly of more value than convalescent serum.

A vaccine to be of value against a human rickettsial infection must fulfil certain conditions: (1) it must produce a high degree of immunity which lasts for a considerable period; (2) it must not produce dangerous reactions nor render the individual a danger to his companions; (3) it must be easily produced in large quantities and must be easily administered. Not all the vaccines suggested for use in man can be said to comply with these requisites. Vaccines, however, have been prepared against exanthematic and murine typhus, Rocky Mountain spotted fever, and more recently Q fever.

Most attention has naturally been directed to finding an efficient means of immunising against exanthematic typhus. Two methods of inoculation have been suggested.

LIVING MURINE TYPHUS VACCINE

In view of the fact that the rickettsia of murine typhus is closely related to that of exanthematic typhus, and that the former produces a much milder disease than the latter, experiments have been made on the effect of injecting murine typhus rickettsias into man. In Tunis, Laigret and his colleagues (1937, 1939) have employed a strain of murine typhus passaged in the brains of mice. The mouse brains are ground up and dried in egg yolk and sodium phosphate. In Morocco, Blanc and Baltazard (1940) have used two methods. In the first the infected tissues of guinea-pigs are ground up in physiological saline and immediately before injection the suspension is treated with bile. In the second the dried fæces of rat fleas (*Xenopsylla cheopis*) infected with murine typhus rickettsias are mixed with bile before injection. In Tunis roughly a tenth of the indigenous population are said to have been injected with the mouse-brain egg-yolk vaccine. As a general rule the injections have been given in areas where epidemics of exanthematic typhus are actually occurring, and according to those who have carried out the injections reactions among natives have been minimal, localised epidemics have been rapidly brought to an end, and endemic foci where the majority of the inhabitants have been vaccinated have remained free from fresh outbreaks for from two to three years. Severe criticism has been directed against inoculation with the egg-yolk vaccine. In Europeans, as well as in some natives, severe reactions have followed the injection and the rickettsias of murine typhus have been isolated from the blood. Absence of reaction has been attributed to the fact that a high percentage of the persons inoculated were previously immune to typhus while, in view of the possible conversion of murine into exanthematic typhus, the widespread dissemination of murine typhus among a population heavily infested with lice would seem to be not without its dangers. In Spain the Laigret vaccine gave unsatisfactory results (Romero Escacena 1941). Very similar criticisms can be urged against the use of bile-treated rickettsias. In the case of Europeans the reactions are too severe to allow of its general use, while in the case of African natives judgment must be suspended until critical and adequately controlled experiments have been performed. Sparrow and Mareschal (1938 and 1939), using a particularly mild murine strain, have found that infections were modified to some extent if rickettsias were inoculated directly into the conjunctival sac. Temperatures between 103° and 104° F. were, however, not uncommon some fifteen days after the inoculation, and in many cases the febrile reactions lasted for as long as ten days. In Japan an attempt has been made to immunise against tsutsugamushi disease by injections of an attenuated strain of the living rickettsias from the island of Formosa.

KILLED EXANTHEMATIC TYPHUS VACCINE

The earliest of the attempts to use killed rickettsias for immunisation, and up to the present the only one to be employed on a large scale, is that of Weigl (1930, 1937). This method consists of infecting lice per rectum with suspensions of living *R. prowazeki*. After a suitable interval the lice are killed; the intestines, swarming with rickettsias, are removed and ground up in a dilute solution of formalin in saline. Although applied on a considerable scale in Poland this method also has certain disadvantages. A very considerable number of lice, usually between 200 and 300, are required for the immunisation of a single individual. As a result a large and skilled staff are necessary to superintend the inoculation and feeding of the lice, while the cost of inoculating a single individual is necessarily high. In addition the method cannot be used in countries such as Abyssinia where lice are normally heavily infected with rickettsias of the Rocha Lima type (cf. Mariani 1940). A similar method, using ticks instead of lice, has been employed by Spencer and Parker (1925) for vaccinating against Rocky Mountain spotted fever. Parker (1935) stated that only 64 out of 150,000 persons vaccinated in the endemic area developed the disease, while more recently it was found (Parker 1941) that among persons infected within one year of vaccination the mortality was only 8·11% as compared with 82·35% among unvaccinated controls. Monteiro (1933) has used the tissues of the infected tick *Amblyomma cajennense* as a vaccine against São Paulo typhus. Immunisation must be repeated at least once a year.

The crux of the whole problem of immunising against rickettsial diseases with dead rickettsias lies in the difficulty of obtaining them in sufficiently large numbers. Numerous efforts have been made to overcome this difficulty. Thus the rickettsias have been grown in serum-tyrode mixtures containing chick embryo tissues (cf. Nigg and Landsteiner 1930 and 1932); the resulting growth, though sometimes luxuriant, cannot always be maintained. Zinsser, Wei, and Fitzpatrick (1937) used as a culture medium agar slopes on the surface of which was smeared chick embryo tissue mixed with a suspension of rickettsias. Cox (1938, 1939, and 1940) has found that injection of rickettsias from typhus, Rocky Mountain spotted fever, fièvre boutonneuse, and Q fever into the yolk sac of the developing chick embryo yields a very rich growth of rickettsias. Formolised or carbolised suspensions of rickettsias obtained by this method have been used prophylactically in the recent outbreak of typhus in Spain. One dozen eggs yield about 100 c.cm. of vaccine, enough to immunise thirty people. Similar methods of producing vaccines have also been used in the case of murine typhus and Q fever.

A somewhat different method has been used in Tunis by Durand and Giroud (1940). This consists in setting up a rickettsial pneumonia in mice or in rabbits, removing the lungs at the height of the infection, and by differential centrifugation of an emulsion obtaining a rich suspension of rickettsias relatively free from foreign matter. The rickettsial suspension is then treated with formalin or phenol. Although no reactions are caused by the injections it is necessary to administer four to five injections at intervals of five days. A good immunity is produced against exanthematic typhus, for a number of persons immunised by this method have been subsequently injected with living cultures of *R. prowazeki* without any ill effects. Only a very partial immunity however is produced against murine typhus, although Castaneda (1941) has proposed the use against exanthematic typhus of a vaccine prepared from the lungs of rats infected with the rickettsias of murine typhus. In countries where both exanthematic and murine typhus exist it would seem preferable to employ a mixture of both types of rickettsia in the vaccine.

Up to the present no large-scale figures are available to determine which of these various methods of immunisation is likely to be most effective in controlling epidemics of exanthematic typhus in the field. Preliminary results in man with the original egg-yolk vaccine have proved disappointing both in this country and in Germany (Wohlrab 1941). Nevertheless, use of the developing chick embryo and the fact that a variety of rickettsias can be adapted to the mouse lung justify a hope that the problem of obtaining rickettsiæ in sufficiently large quantities to constitute efficient vaccines is in a fair way to being solved.

Specific immunisation, combined with destruction of the vectors together constitute measures which, if efficiently applied, bid fair to rid the human races of the scourge of rickettsial infections.

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SCOTLAND

FOUR TERMS A YEAR

AT a graduation ceremony at Aberdeen University on April 2 Lord Meston, the chancellor, recalled that in 1937 representatives of the Scottish universities agreed to recommend that the medical curriculum be lengthened from the minimum period of 5 years or 15 academical terms. Aberdeen adopted this recommendation and in October, 1938, all students beginning the study of medicine entered on the extended course of 5½ years or 17 academical terms. When war broke out none of the other Scottish universities had introduced the longer curriculum and all of them decided to continue meantime with the old 15 terms, since if the new curriculum were to be carried through as originally planned there would be no medical graduates in 1943, for students starting in 1938 could not complete their course before April, 1944. Aberdeen had decided to carry on with the new course but had promoted an emergency ordinance which gave it powers to include in any calendar year a fourth academic term. This it could do by running an extra term in the summer vacation. The university had decided to make use of these powers and to accelerate the curriculum during the fourth and final years. Students who completed their fourth academic year at the end of June, 1942, would take extra terms during the summer vacations of 1942 and 1943 and graduate at the end of September, 1943. He emphasised that this decision did not indicate any change of view regarding the importance of an extended curriculum, nor did it lend any support to the contention that there should be a general acceleration of the medical curriculum. The sole purpose was to secure a steady flow of well-trained doctors.

TOXÆMIAS OF PREGNANCY

In his Honyman-Gillespie lecture in Edinburgh on March 19 Dr. Douglas Miller gave some observations on the eclamptic toxæmias and on hypertension and chronic nephritis in pregnancy. Since Volhard's work in 1924 the view has increasingly gained ground that eclamptic toxæmia is to be regarded as a generalised vascular disease in many ways similar to essential hypertension. The similarity is indicated by the lability of the blood-pressure in the early stages, and by the response to the cold-pressor test of Hines and Brown. A familial tendency to hypertension is to be found in a significant number of toxic patients. It is wise, however, to continue to regard eclampsia as an entity in itself peculiar to pregnancy. Such terms as nephritis of pregnancy, nephritic toxæmia, occult nephritis and low reserve kidney should be discarded because they place undue emphasis on the rôle which the kidney plays and tend to obscure the fact that in toxæmia the disturbance is primarily a generalised vascular lesion, impairment of the kidney being either entirely absent or occurring only as an incidental or secondary effect. There is no evidence that toxæmia is a manifestation of impaired kidney function, or that pre-existing chronic nephritis is ever in itself a cause of toxæmia.

The prognosis of toxæmia uncomplicated by essential hypertension or chronic nephritis depends on the number and severity of certain features. According to Eden, if two out of the following occur there is a fatality of 32% —deep coma, more than ten fits, pulse-rate over 120 per min., temperature over 103° F., systolic blood-pressure over 200 mm. Hg, urine solid with albumin on boiling. If none of these is present the fatality does not exceed 7%. A fall in blood-pressure without other signs of improvement is a very bad sign, indicating myocardial failure or peripheral circulatory collapse. The severity of œdema bears little apparent relation to prognosis. Some of the cases of "dry eclampsia" may be examples of hypertensive encephalopathy due to essential hypertension and not true eclampsia. The after-effects of toxæmia are cardiovascular rather than purely renal. The incidence of permanent after-effects depends rather on the duration than the intensity of the toxæmia. The frequency with which hypertensive disease follows toxæmia has been variously estimated. Where pre-eclampsia or eclampsia develops in a woman previously healthy permanent cardiovascular damage will be sustained by at least 1 in 4. As regards the prognosis in pre-existing essential hypertension complicating pregnancy, it is probable that in half the cases pregnancy will aggravate the disease, and in 1 case in 3 the aggravation will not subside after delivery. When chronic nephritis complicates pregnancy there is, as a rule, a progressive deterioration in the condition as pregnancy advances, and the fœtal and neonatal death-rate is very high. With each successive pregnancy the aggravation in symptoms appears earlier and is more severe.

The treatment of the eclampsias has undergone a fundamental change in the past two decades from radical to conservative. Routine antenatal work has greatly improved the early recognition of the toxæmias. Tribute must be paid to the work of Stroganoff and Tweedie. In the detection of incipient toxæmia, determination of the blood-pressure level and of changes in weight are of greater importance than examination of the urine for albumin, since albuminuria may not appear until the toxic disturbance has been established for some time. In an established case of moderate severity the patient is isolated in a quiet, dark room and not disturbed in any way, except for necessary treatment. A retention catheter is passed and the urinary output measured two-hourly, together with the blood-pressure, temperature, pulse-rate and respiratory rate. Constant observation by the doctor and nurse is necessary. The lower bowel is cleared by an enema, but gastric and colonic lavage are omitted. Sedative treatment consists in the administration of morphia, gr. ¼, at once and three-hourly until the seizures subside, unless the respiratory rate drops to 12 per min. Chloral hydrate, gr. 30, is given per rectum every eight hours; 20 c.cm. of a 10% solution of magnesium sulphate is injected slowly intravenously and may be repeated every twelve hours; 500 c.cm. of a 20% solution of glucose may also be given by the same route if œdema is severe. Saline infusions are strongly contra-indicated, as are also sodium containing drugs in any form. To avoid respiratory embarrassment maintenance of a free air-way is essential. Pulmonary œdema associated with left ventricular failure is treated by intravenous glucose, the slow withdrawal of 500 c.cm. of blood, oxygen and rapid digitalisation. If there are indications of peripheral circulatory collapse shock therapy is instituted. Nothing is given by mouth until the patient is fully conscious. Thereafter she is

given water, fruit juices and milk, proceeding cautiously as the diuresis increases and watching the general condition. Dr. Miller stressed that in pregnancy and in patients who may become toxæmic drastic restriction of protein and the forcing of fluids should be discouraged. In so far as obstetric treatment is concerned, if the cervix is taken up and the uterus hardens on abdominal palpation labour is induced by puncture of the membranes. After the cervix is fully dilated delivery is completed in the most appropriate way. Cæsarean section may very rarely be performed in the severe case which is not responding well to treatment and in which the reaction to induction is likely to be unsatisfactory. In view of their action on the vascular system the ergot group of drugs should not be employed post partum.

A SECURE PLACE OF REFUGE

The stigma which has attached itself to the word "asylum" has been giving trouble in Scotland. People in Fife are apt to think that voluntary patients are not treated at the county asylum at Springfield, and many who can ill afford it are sending their relatives as paying patients to other mental hospitals, or keeping them at home till it is too late to treat them successfully. Dr. William Boyd, medical superintendent at Springfield, has told the joint asylum committee that the wording of the Lunacy Acts precludes any change in the name of the institution, but efforts had been made and would be made again to revise these sections in the acts. In the meantime when a new hospital was added to the asylum the opportunity was taken to christen it Stratheden Hospital, and Dr. Boyd hoped that in time the whole institution would be known by this name. The committee suggested that "asylum" should be changed to "mental hospital," "nerve institution," or "psychological institute." But the difficulty of keeping nomenclature ahead of popular prejudice was shown by a plea made the same day at a meeting of the Dundee branch of the Scottish Association for Mental Hygiene, when Dr. D. J. Forbes, of Baldovan Institution, urged that the term "institution" should be dropped. Mr. John Mann, headmaster of Fairmuir Special School, wanted to get rid of "mentally defective" and "feeble-minded" too. Surely it is a pity to go on spoiling good words if the new name is soon to excite the same prejudice as the old.

In England Now

A Running Commentary by Peripatetic Correspondents

GENERAL practitioners ought to be (and in rural areas certainly are) the handymen of medicine. Many take great pleasure and a modest pride in the diversity of tasks they perform. It is not unusual to find a general practitioner who is a sound physician, a good obstetrician, a reliable anæsthetist, no mean psychiatrist and even—within limits which he fully recognises in himself—a safe surgeon. If and when the health-centre system becomes established, will the general practitioner still be permitted to exercise his hard-won skill in divers directions; or must he, forsaking all others, cleave only to one small specialty? Must he, for instance, because he chooses to do obstetrics, give no more anæsthetics or perform no more herniotomies? May not the doctor who looks after the pneumonias tackle an anxiety-neurosis or remove a tonsil or two by way of a change? Variety and varied responsibilities are to some of us the spice of life. If the new system converts the handyman into a limited and rigid sort of petty specialist, the community, no less than the general practitioner himself, may lose more than it gains by the change.

* * *

The cold weather—now happily passed, one hopes—brought into high relief the peculiarly ostrich-like attitude of the Englishman to his climate. Is it because one's first lesson in geography lays down firmly and for ever that the Gulf Stream gives the British Isles an equable climate with mild winters, in contrast to those poor fish on the Continent? In fact we do not, in general, have mild winters. Not great cold, of course, nor deep snow, but enough each year to cause endless annoyance, and in war-time serious loss to the war effort. A Czech acquaintance, an engineer, travelled between Manchester and London during a cold snap, and his comments were all the more irritating for being justified. Woken in his sleeper by the failure of the heating halfway to London several hours after he should have arrived there, he was told that the delay was due to "freezing of the points." "In my little backward country," he replied, "forty years ago when I was a boy we knew how to deal with frozen points; we sprinkled a little salt on them." "Was the heating system," he asked, "for use in summer or winter?" Because, for technical reasons which I could hardly follow, it appeared to be designed so that in severe cold it would almost inevitably freeze between the carriages, thus ensuring that the occupants of the first carriage would be parboiled, while the rest froze. Driven to loquacity by the memory of his frozen water-bottle, he described the efforts of a string of engines in a few inches of snow to leave their shed adjoining his works on three successive days. Unable to bear it any longer he made his foreman knock up a snow-plough out of some "blitzed" pipes, and presented it to the engine-drivers with his compliments. They were as pleased as a child with a new toy, and sailed triumphantly out of the yard. This should not be. In a country pouring out millions a day on its war, a little money, time and thought expended on organising against winter dislocation would be well spent. If we are inexperienced in such organisation there are plenty of refugee technicians from central Europe to advise us.

In another department of life we allow ourselves to suffer seriously—and quite unnecessarily—from the effects of frost. Winter after winter one hears the same tale of burst pipes, damage, discomfort and loss. For this, I suppose, architects must be primarily to blame. The ordinary man who builds, buys or rents a house looks to his architect or surveyor to advise and protect him against inconveniences or difficulties. How is it that we are allowed to go on building, buying or renting homes with unlagged pipes running under the eaves with nothing but a few unlined tiles to protect them from the bitter North-Easter? Is plumbing beneath the dignity of an architect, or does he just not think about it? The Gulf Stream has a lot to answer for. For that matter, why are our fireplaces and chimneys so often on the outside wall? To warm the garden? In December, 1918, in a miner's cottage at Frechen, near Cologne, I was laid low with 'flu. There was no fireplace in the bedroom, but lo and behold the miner's wife opened a shutter in the wall and beautiful warm air, with no smoke, flowed in from the kitchen stove. The battalion moved on in a hurry, and in any case I was not then interested in public-health questions, so that I never investigated the details, but if a German miner could have this in his cottage why can't we? Perhaps some architects will reply.

* * *

The farm lies in a hollow, out of sight of, and two wet and trackless fields away from, the nearest road. I struggled down to it through the mud to find a pop-eyed and flea-bitten farmer in the throes of an attack of acute cholecystitis. Five times, very slowly and carefully, I explained to him and his mother what was amiss, that I expected the present attack to subside within a few days, but that he had better consider the advisability of having an operation to prevent further attacks, and prescribed measures for his immediate relief. Next morning there came another urgent call to the same farm. Once more I motored the six miles and trudged across the two fields to find the patient a good deal better. "What is really wrong with him, doctor?" asked his mother. I drew a deep breath. Five times, very slowly and carefully and mostly in words of one syllable or two, I described the condition, prescribed immediate treatment and advised admission to hospital at a not too distant date. I took my leave of him and his mother saw me to the door. I was about to depart when with arms akimbo she barred my way. "And now, doctor," she said, "I wants vor you to tell me what is *really* the matter." I gave it up and fled.

* * *

I have just read a book on the skin and its diseases, quite a good local guide-book, but it doesn't tell me much about the country as a whole—the "oneness" of

skins. It doesn't tell me why when I found that I had got scabies—not when I got them—the whole of my skin panicked and kept sending alarms from all sorts of unlikely places. One of my colleagues reacts in this way to the written word "scabies," and several others do when they see a grazing herd of *Pediculi capitis*. I once heard a boy say, "I rather enjoy chilblains, you get such a lovely feeling rubbing them." Now there is a problem my book didn't touch, a problem ranging from the original amœba's reaction to its first bath, the semi-hypnosis of cats and dogs by stroking, to the common human habit of stroking the chin to assist or quell thought. Then there was the man in the canon's stall at the service for ARP workers at the cathedral last Sunday, whom I watched detaching a small scab from his forehead. It must at last have fallen, for I saw him searching round and round for it on his surplice and the seat. We all got up and sang, but when we sat down again I saw that search still going on—a reasoned search, for it explored the desk where the scab might have fallen from the surplice when he stood up. We knelt down and again I saw that right hand restless, hunting hassock and cassock. I have seen my fox-terrier doing the same thing; he eats his when he finds it, but I can't say what the canon would have done if he'd found his. But why this very persistent search for so small amount of nutriment? My skin Baedeker has no information on the subject.

* * *

"I had no idea an operation was such a chatty affair." Thus the occupant of the room next the nursing-home theatre. And I suppose we surgeons and anæsthetists are rather prone to treat what may be a matter of life and death in a spirit of light-heartedness. Ogilvie put it well when he said that operating as a sport was a purely British conception. Understandable, no doubt, since we seem to go about our wars in the same fashion.

The other morning I suggested to my wife, who although a laywoman has witnessed several operations, that she should come to the theatre in ten minutes' time to join us for 'levenses after my next case, which was a simple rib-resection for empyema under intravenous 'Pentothal.' The anæsthetist had hit the bull's-eye, and the knife was in my hand ready for the incision, when the patient coughed and went horribly blue, and creamy pus began to trickle from her nose. She had ruptured the empyema into a bronchus. Immediate passage of a hastily-produced bronchoscope, together with an extreme Trendelenburg tilt, allowed the pus to run out and give her an airway. House-surgeon, nurses and porters hung on to her legs, arms, and shoulders to keep her on the precipitous table, while a rapid rib-resection allowed the tension in the empyema to expend itself outwards instead of inwards. (Incidentally, she made an uninterrupted recovery.) At this stage my wife arrived for her coffee, and finding the surgeons' room empty peeped in through the door of the theatre. Her comment later was illuminating: "Whatever were you doing to that poor woman? I thought she must be pretty bad, because you were all looking as serious as we expect you to look when you're operating on us." It raised visions of operations seen at the pictures—chromium-plated theatre, discreetly draped body, male chorus of eager students and female ditto of nitwit blondes, the whole subservient to brilliant surgeon (preferably young and Adonoid, complete with headlight and stethoscope in situ, but without glamour-obscuring mask), and an all-pervading air of tenseness; for the knife to slip the hundredth part of an inch would mean death—admirable as a setting for bilateral pneumonectomy or decerebration, but how long could we work at that pitch? Major procedures (not forgetting that what is major to one surgeon is chicken-feed to another) of themselves evoke the requisite amount of concentration, but when an operation is so familiar as to become mechanical we just couldn't stay the course if we lived up to the Hollywood standard all the time. Hence the relaxation afforded by the tonsils and appendixes on the end of the big list, even though such minor operations must be performed with the care which is their due.

Imagine the feelings of the patient if he knew that his was to be the privilege of providing light relief for a tired surgeon! There is something in professional secrecy after all.

* * *

My old missus says you must cook a sauce for twenty minutes and that is where so many of them fail—they are not cooked long enough. We have to face the possibility next winter of living on the potatoes and the pulses that we grow this spring, and sauces are then going to be more important than they were. You can get on with potatoes so far as calories are concerned, and you can take vitamins in tablet form, but there is a third thing in diet and that is variety and flavour. This is where potatoes and pease pudding fail. One lot of flavourings comes from fruit, but with these you are dependent on sugar. Jam goes very well with potatoes, but we cannot get jam. The other comes from herbs with or without sauces. Boiled potatoes with a sauce that has so much parsley in it that it is quite green make an excellent meal. I do not want to have my dinner off this every day, but we may come to it. As an occasional one it is already on our menu; chopped chives makes another. Both these herbs grow well in London and if in London why not in a midland town? We had parsley sauce the day after the snow melted, and there is one thing about parsley that we learnt from Sutton's book. Never pull up a bit of "rogue" parsley, which means self-sown. It will be the best bit in the garden, waxing like the mustard-tree in the Gospel, which is a picture from the Jordan Valley. But sauces need something else beside the flour and the flavouring, and that is milk; and how are we going to spare that? To save dried milk in the summer won't do because it does not keep; and tinned milk is not over plentiful. Can anyone recommend a substitute for milk in a sauce? There is a bit of research for the housewife. In a high-potato diet its first cousin the tomato should play a part; but again the question of keeping comes in. My old missus, being a nurse, had a shot at it. She boiled her jars and boiled the tomatoes and poured them straight in, and used boiling paste she had made herself without touching the paper. But one spore would get in and one spore is enough to cover the jar like a microbe in a petri dish if you leave it long enough. It will keep all right in the refrigerator; but even those who have one cannot fill it with six months' supply of tomato purée. She keeps an eye on it and boils it down again as soon as she sees a fungus beginning to grow. That takes a lot of labour and a lot of gas, but she is going to try again; and tomatoes also grow well in London. I know a couple who grew 160 lb. against the north fence of a small garden. At that rate you can guzzle tomatoes while they last and still have quite a lot to keep at any rate through the first part of the winter.

* * *

"Half-past-six, sir." I rolled over in my camp bed and pulled my blankets more tightly over me, as I glared at the youngster who was my batman. On a box in the far end of the bare dirty room was a basin of water. I slid out of bed and tried it; it was tepid again, but that really was not to be wondered at. There was no water or heating in the old house in which we were living, and the wretched batman had to carry the water from the nearest cookhouse; with snow lying thick on the ground it was not surprising that it had cooled in transit. Shaving was dismal, like my reflection in the mirror, and my reflections as I shaved. A week before I had been billeted comfortably in a colleague's house, and working hard at an adjacent hospital—a pleasant, busy appointment. Then one day came great news: authority had decided to recognise me as a specialist. Within a week I had left the hospital, and was installed as medical-officer-cum-sanitary-inspector, remote from all hope of practising the art. My bitter reverie was interrupted suddenly as I caught another reflection in the mirror—that of my batman moving with coal-black hands to clean my tunic. "Get out," I shouted, "I'll clean it myself. And what's more I'll do my own boots." They say medicine is a good all-round training.

The address of the drugs branch of the Home Office is now Meyrick Cliffs Hotel, Beacon Road, Bournemouth. But applicants for import or export licences under the Dangerous Drugs Acts should be made to the finance branch at Trouville Hotel, Priory Road, Bournemouth.

Letters to the Editor

MEDICAL WOMEN WITH THE FORCES

SIR,—It seems desirable to the Medical Women's Federation to clarify the situation as to the difference in the terms and conditions offered to medical men and women serving with the Forces. The federation is anxious that women should respond to the appeal for women doctors in the Forces, but is profoundly disturbed that the long-established and well-proved principle of complete equality between medical men and women is being infringed, thus creating a precedent which paves the way for trouble now and in the future.

A medical man receives a commission *in the land forces* to serve in the RAMC or RAF medical branch. He is thus regarded in some degree as a soldier as well as a doctor; he may be asked to carry out certain combatant duties and is given general disciplinary powers. A medical woman is offered a commission *in the women's forces* for service *with* the RAMC and the RAF(MB). It is argued that there is no authority for offering a woman a commission in the land forces; and that a woman doctor cannot have disciplinary powers or any combatant duties.

The Medical Women's Federation has no grievance as to pay and allowances; on this score there is complete equality with their men colleagues, and they have "relative rank." The federation is fully aware that women doctors with the medical services are as a rule working happily under their commanding officers, and that they have received fair and just treatment. However, they suffer definite handicaps. They are *not members of any* service, and they have no settled status. Regulations peculiar to them may be made at any time, since RAMC, RAF(MB) and other service regulations do not necessarily apply to them. The Women's Services (Nursing, ATS, WAAFs) each have an established organisation and each woman is a part of her service; all have their status fully recognised and defined.

The Medical Women's Federation is strongly of the opinion that it would work for greater efficiency and stability to grant medical women commissions *in* the Medical Services; this would ensure a generally recognised status and the protection afforded by membership of a professional body having defined conditions and established precedents. The federation cannot see that there is any insuperable difficulty in creating if necessary a temporary women's section *in* the Medical Services, having appropriate functions and duties. In the event of an acute emergency, such as invasion, medical women would be expected to rise to the occasion just as medical men would do, and in such circumstances it would unquestionably be easier for all concerned if they had well-defined rank and status. This argument applies with even more force in the event of conscription of medical women. The federation hopes that this course will be adopted. The present inequality of status is definitely a retrograde step, contrary to the principles which have been accepted as fundamental by the British Medical Association, and which have been found to work in the best interests of both medical men and women.

The federation feels that the course to take at present is to advise medical women to accept "relative rank" in the meantime, but *not to accept commissions in the Women's Forces.* This leaves the door open for a more equitable arrangement at any future date; whereas the acceptance of commissions in the Women's Forces will permanently put medical women in a separate category from their male colleagues.

CLARA STEWART,
President, Medical Women's Federation.

VITAMIN C IN TRANSPORTED MEALS

SIR,—The Ministry of Food has provided in many parts of the country large depots for supplying homeless persons with hot meals in cases of serious bombing, and use of these is being made on a large scale to supply canteens, including school canteens, with hot dinners which have to be transported considerable distances and are kept warm in a hot-plate installation for prolonged periods. Now it is well known that in the case of vegetables treated in this way vitamins are lost or destroyed and on such a scale in the case of vitamin C (the scurvy-preventing vitamin) that the amount left might average less than 10% of the original quantity. It is also true to say that the persons who get these hot meals including school-children will be depending mainly on them to obtain their supply of this vitamin so essential to health.

I suggest therefore that, in the coming spring, summer and autumn months, vegetables be served in the form of salads, for in salads nearly all the vitamins would remain preserved; or, if this is not possible, that ascorbic-acid tablets of at least 25 mg. should be given with each meal. Regarding the meals for school-children it has been suggested to me that raw grated turnip, kohlrabi or swede could be served with the hot dinners and to these I would add raw minced parsley, mustard and cress, or watercress, mixed with mashed potatoes. If this procedure were carried out first, salads could be more gradually introduced and given in larger amount until the children got used to them. If something of this kind is not done those partaking of these meals are neither receiving the benefit they should get nor being protected adequately against disease.

Glossop. E. H. M. MILLIGAN.

DIAGNOSIS OF PERNICIOUS ANÆMIA

SIR,—The letters of Professor Davidson and his co-workers and of Dr. Stark Murray call for comment because both represent retrograde views. I think the former are referring to their correspondence with me; they did me the honour of inquiring about the classification of erythroblasts that I, among others, have advocated. I endeavoured to explain, as fully as is possible by correspondence and sending specimens, the basis used and the difficulties experienced in its application; in return they sent me some of their slides. They were, it seems, unconvinced by these efforts, and, for my part, I thought that their technique was not that best adapted for the differentiation of megaloblasts and normoblasts, and that in their good slides the differentiation could be quite easily made not only by myself but by others less experienced. The Edinburgh workers still thought their methods were best and they are, of course, entitled to their opinion, but they have had to adopt a classification which, though useful—and undoubtedly easier—for the special research they were engaged on, is I feel uninformative and confusing. In ordinary times we would all have met and discussed our differences personally and not through correspondence only; I hope that by the time this is again possible the Edinburgh workers will either have become more convinced or have produced a more convincing alternative.

In your leader of March 21 you discuss which among the various systems of classification at present available is most useful to the clinician for diagnostic and therapeutic purposes. As I wrote on this subject as recently as August, 1941, I naturally support the view that what is most useful is whether a marrow is hyper- or hypoplastic or about normal, whether megaloblastic or normoblastic. By megaloblastic I mean that all members of the megaloblastic series, from early to late, are present and in significant numbers. It is known that megaloblastic marrow occurs in pernicious anæmia, in the refractory achrestic anæmia and in certain nutritional anæmias such as that accompanying sprue; apart from these, in my extensive experience normoblastic marrow is always present. Therefore megaloblastic marrow is of diagnostic significance; but no-one is going to base diagnosis on "the presence in the bone-marrow of any particular red-cell or white-cell precursor"; it is the *total change* in the marrow picture that is important—your leader perhaps does not make that sufficiently clear. I think this differentiation can be made with fair certainty after suitable training, and methods like those I have advocated are now in regular and successful use by several hospitals and practitioners in this area, among others. The normal range of variation in the differential cell-counts of sternal marrow material has been shown by all workers to be large; consequently only gross changes are significant and I think that it is still more useful for the clinician to know the main qualitative changes in the marrow than to be presented with a set of figures representing the proportion of "types" present—especially when these types don't reflect the point he chiefly wants information about.

How often is sternal puncture needed? The practice

of this department may be helpful. As in most clinics, the majority of the patients are dealt with as outpatients, the minority as inpatients; sternal puncture is done rarely on the former, commonly on the latter. The indications are: any doubt about the diagnosis such as history of failure of liver treatment, unusual age, or exceptional clinical signs or symptoms; grave anæmia with an equivocal blood-picture; and finally any case the subject of current research about whom the fullest information is desirable.

To treat a patient with liver extract before getting a blood count is certainly indefensible, but reliance on the halometer—or any other method of measuring red-cell size—has also led to mistakes because, as has been often shown in the literature, increased red-cell size may occur in other conditions than pernicious anæmia. If clinical findings and blood-count are not diagnostic the investigations to be made are, in order of importance, sternal puncture, fractional gastric analysis, examination of the serum for bilirubin and methæmalbumin. Dr. Murray properly regards reticulocytosis after a dose of liver extract as important confirmation of pernicious anæmia, but this takes time and sternal puncture will save possibly vital days.

Diagnosis in hæmatology, as in other branches of medicine, depends on the consideration of the whole picture presented by all the information available; the results of sternal puncture are an important part of this picture, but must always be judged in relation to the rest of the clinico-pathological combination. In my work I have been in the fortunate position of being both physician and pathologist. In hæmatology this seems to be a useful combination; I see no reason why the physician should not be encouraged to use his microscope as he did in Osler's day, and surely a physician ought to know what tests to apply in a given case and also to have a fair idea of the possible results; it is in the difficult cases that the clinical pathologist's extra knowledge will be needed.

Manchester Royal Infirmary. M. C. G. ISRAËLS.

MIGRAINE RELIEVED WITH A HORMONE

SIR,—A case in which attacks of migraine were brought on by administration of œstrin suggested to me the possibility that migraine might be relieved by a counteracting hormone. A woman of 25, who had suffered from periodical attacks of migraine severe enough to keep her in bed, sought treatment for an obscure vaginal discharge which was apparently glandular in origin. She was given stilbœstrol, a tablet of 1·0 mg. t.d.s. by mouth, and after the third tablet she was violently sick and had a typical attack of migraine. When the natural hormone was substituted the result was the same. An intramuscular injection of œstradiol benzoate, 10,000 units, was then tried, and this was followed by an attack of migraine within three hours. She was then given anterior pituitary-like hormone in the form of 'Antuitrin S' (PDCo) in increasing doses for two weeks and has since remained free from attacks. If then, I argued, migraine can be induced, in certain cases at least, by excess of œstrin or some similar substance, it is reasonable to expect benefit from treatment with a hormone, obtained from pregnancy urine, with luteinising properties. Accordingly over a period of fourteen months I have given antuitrin-S by subcutaneous injection to a series of 20 unselected cases of migraine of whom 15 have lost their headaches and other symptoms entirely and in the remainder the interval between attacks has been prolonged and the attack shortened. I begin with 75 rat units, followed by 100, 150 and 200 units at intervals of 4–6 days. Then 200 to 300 units once or twice weekly for two weeks depending on the severity of the case. After this 250 units weekly for one month, continuing with 250 or 300 units monthly for two months. These doses can be increased without danger if an attack is severe, but care should be taken not to give an injection within 3 days of the expected date of the menstrual period. In most cases such a course is sufficient, but severe cases may require a continuation of treatment with 300 units, at least once a fortnight, to keep up improvement, or 500 to 600 units on alternate days for a week if attacks are brought on by a toxic condition such as influenza. In some of the cases there was no apparent relation between the migrainous attacks and the menses. Only one case of migraine in a male has been treated, but this also yielded to a series of injections of antuitrin-S.

Little is known about the exact composition of the APL hormone which has to be distinguished from the gonadotropic hormone said to be present in the urine of some migrainous patients before and during an attack.[1] That APL hormone acts through the pituitary and not directly on the gonads is shown by the fact that no effect is produced in the experimental animal if the pituitary is first extirpated. Chemically, also, it has been shown that while cysteine completely inactivates the pituitary gonadotropic hormone it has no effect on the APL hormone.[2] The treatment of migraine with this hormone does not appear to have been reported in this country though Moffat, in Canada, has described 17 cases of menstrual migraine treated with 'Follutein' (Squibb). Using much smaller doses he nevertheless reported good results.[3]

London, W.1. NEVIL LEYTON.

RCS COUNCIL ELECTION

SIR,—We desire to draw the attention of all who have the best interests of the Royal College of Surgeons at heart to the forthcoming election to its council. The average age of the present council is over 62 years and three of its members are septuagenarians. The college is particularly fortunate in having at this time a president equipped at all points to guide it and shape its future destiny, but we believe the council need younger surgeons to help in framing its policy today.

A fellow is elected for a first term of eight years and it is the accepted custom for him to serve a second, making sixteen years in all. Of recent years there has been an increasing tendency for councillors to seek a third term, and it is the harmful effects of this practice we wish to bring to your notice. This leads to an inevitable increase in the number of members of seventy years or over, and delays the successful candidature of men of the right type and age, so that they either abandon their hopes or apply when they are too old. In this present election two councillors offer themselves for re-election for a third term, both of whom personally we regard with respect and affection, while other candidates are already of such an age that the end of their first term will bring them near to the 65-year standard.

The future is unknown but enough can be seen of the trend of affairs to leave us in no doubt that our profession must face problems of great complexity in reorganising the whole structure of our professional lives and in regulating our relationship with the state. It seems both just and logical that those who will have to live and work in this new world should help to fashion it. For this reason we believe that the council is in urgent need of younger men of established professional reputation and known administrative experience.

We hope that in recording their votes fellows have already had in mind these points we have raised, and that those who have not yet voted will not fail to do so after giving careful consideration to what we believe to be the best interests of the college. If in the future its influence wanes and its counsels are no longer heard in the land, it will be useless for us—the voters of today—to lament, for we shall have had our chance and thrown it away.

ERIC A. CROOK, J. B. HUNTER,
W. D. DOHERTY, G. T. MULLALLY,
R. M. HANDFIELD-JONES, GEORGE E. NELIGAN,
RUPERT VAUGHAN HUDSON, VICTOR RIDDELL,
J. BASIL HUME, W. H. C. ROMANIS,
Fellows of the College.

RELIEF OF FAMINE

SIR,—We view with deep concern the state of famine existing in most of the German-occupied countries. We realise the great difficulties in the way of relief but feel that every effort should be made to find a way, as victory will be robbed of much of its value if thousands of our conquered allies starve before it is achieved, and as a generation which has been warped in body and mind by starvation cannot be fit to meet the immense problems

1. Riley, H. A., Brickner, R. M., and Kurzrok, R. *Bull. neurol. Inst. N.Y.* 1933, **3**, 53.
2. Fraenkel-Conrat, H. L., Simpson, M. E. and Evans, H. M. *J. biol. Chem.* 1939, **130**, 243.
3. Moffat, W. M. *J. Amer. med. Ass.* 1937, **108**, 612.

of post-war reconstruction with the vision and courage which they will demand. We appreciate the difficulty in accepting the word of the German government, but believe that a scheme of controlled food relief similar to that proposed by Hoover in February, 1941, could be operated as successfully in this war as his similar scheme undoubtedly was in the last war; in any case the amount of food in the country under the scheme at any given time would not make any significant difference to the war if it were seized by Germany, an event which would immediately result in the ending of the scheme. We think that some such body as the International Red Cross would be willing and able to operate such a scheme if the governments concerned were willing. We realise that shipping is a serious problem but think that this might be supplied by neutral countries, or if this were impossible that it is our duty to liberate for their immediate and desperate need some of the merchant fleets which the occupied countries have put at our disposal. Single ships sailing under the International Red Cross would not need to be convoyed. We are grateful for the relief now being allowed to Greece, but are concerned that it should be adequate and should be extended to the other starving occupied countries of Europe.

Newcastle-on-Tyne. JEAN BELL, DONALD RAMAGE, HELEN GURNEY, ELSIE WRIGHT. ENID HUGHES,

JAUNDICED CHILDREN

SIR,—During the last few weeks I have seen at least 10 children (aged 3–14) suffering from jaundice—pale stools, dark urine, yellow sclerotics and vomiting, &c. The condition has cleared up readily within 10–14 days on a fat-free, plain diet plus a bottle of rhubarb and soda. I think the cause is the excessive quantity of fats—dripping, lard, suet, &c.—in the diet, minus fruit. In view of the fact that the epidermis is more grateful for a constant soaping than is the gastro-intestinal mucosa, would it not be a good thing if the cooking-fats ration were halved and the soap ration doubled? Or are these cases of simple dietetic jaundice, portents of some coming epidemic?

Kearsley, Lancs. D. OCKMAN.

HOSPITAL'S LIABILITY FOR NEGLIGENCE OF STAFF

SIR,—It would be unfortunate if the obiter dicta of Mr. Justice Tucker (*Lancet*, April 11, p. 457) following Swift J. should encourage a contention that hospitals ought to be liable for the negligence of qualified technical assistants. Incidentally it may be noted that the attention of the court does not seem to have been directed to an analogous American case mentioned by Dr. S. W. Donaldson in "The Roentgenologist in Court" (p. 56). The decision of the court in favour of the physicians owning the hospital is the more noticeable as the American courts, while generally disposed to give judgment in favour of charitably maintained institutions, are not so kindly disposed towards those owned by private individuals. Actions in the English courts are only brought against the hospital authorities as they possess the means to pay substantial damages. The sound procedure from the point of view of administration as well as of law is to make medical auxiliaries liable for their own negligence. If patients demand damages for one slip after a number of careful treatments then technical assistants, like medical men, will have to insure for their own defence.

Essex Street, W.C.2. C. E. A. BEDWELL.

DOSAGE OF INSULIN

SIR,—I think it must be admitted that the avoidance of errors in dosage is a problem. Owing to the variation in the strengths of insulin, there is much to be said for discarding all syringes with unit markings and to use, as Dr. Lawrence does, the 1 c.cm. syringe without other markings than those in cubic centimetres, and without any minimum markings to complicate things. Dr. Behr's assumption that hospital patients can be made to understand decimal points is not always true, although very desirable. We have therefore introduced at the Willesden General Hospital diabetic clinic rough-line drawings of the 1 c.cm. syringe, indicating the measurement of insulin by an arrow drawn in ink. Further, to make things as simple as possible, we favour keeping to one strength of insulin—namely, 40 units per c.cm. for most cases—but exceptions are recognised. Unfortunately the present scarcity of syringes does not permit us to insist on a special type.

Harley Street, W.1. S. L. SIMPSON.

ZINC PEROXIDE

SIR,—Having recently had the privilege of meeting Dr. Meleney in New York, and seeing demonstrations of his technique, your leading article of April 4 on the use of zinc peroxide interests me very much. There is grievous complacency in some quarters about what can and cannot be done for heavily infected wounds. No-one will deny that modern chemotherapy has done much to control microbic infections, but this is hardly true once sepsis is firmly established in wounds and has become chronic. Until such time as chemotherapeutic advance makes the control of chronic wound sepsis really practicable it is well to explore fully all other forms of treatment which show promise. The efficacy of zinc peroxide has been doubted by some of those who have used it in septic wounds, but it appears that at least certain of this number have not followed accurately the technique as described by its originator or have used unsuitable zinc peroxide. Dr. Meleney kindly gave me a small supply of the peroxide he uses, and I should be pleased to send a few grammes to anyone requiring it for comparative chemical assays.

London, N.W.11. W. R. THROWER.

STUDENTS' CALL-UP

SIR,—As a final student who has spent about six years on his medical studies and passed part of his final, I view with deep concern the decision of medical schools to dereserve all final students who fail in their examinations on two or more occasions (see *Lancet*, March 28, p. 392). Such a decision implies that repeated failure in examinations means slackness and waste of time on the part of the students. There is no denying that some students are slackers. Such students should in any circumstances be weeded out both in the interests of the profession and the interests of the national effort. But there are many capable students who, though working very hard and achieving a good standard of practical knowledge, yet fail in examinations because of their psychological make-up. To dereserve such men would be a loss of valuable material to the profession, and a loss of valuable time to the students themselves. It would surely be wiser to grant them junior appointments in EMS hospitals, thus enabling them to continue with their studies, to render service to the community for which they are already equipped, and to release qualified doctors for the forces. Such appointments should of course be on the recommendation of deans or teachers.

SIXTH YEAR MEDICAL STUDENT.

"RAT VIRUS"

SIR,—In his interesting article in your issue of Jan. 31 (p. 158) on the control of rats, Mr. Hardy comments rather unfavourably on the use of "rat virus" because rats are liable to become immune to it and also because certain cases of enteritis have been attributed to the bacterium employed in such viruses. Few real attempts appear to have been made to check up in the matter. Rat-virus bacteria belong to the salmonella group and outbreaks of disease attributed to the virus mostly seem to have occurred before this group was properly classified. Rat viruses have been sold on the open market for years and are employed on a large scale by rodent-destruction companies throughout the world. If the risk due to their use is appreciable it is remarkable that more outbreaks of disease caused by them have not been reported, and it is still more remarkable that no case of disease has so far been recorded among the staff of the laboratories where the cultures are prepared. Any suspected infection should be investigated, the bacteria isolated from the patient being compared with the original cultures both by agglutination and fermentation tests and by animal experiments. Due weight should be given to the fact that rats are notorious carriers of salmonella and other infections and that among the organisms which they carry in nature is the one used as an antidote against them. Rats also harbour the

fleas which may carry typhus and other diseases. If these rodents can be largely controlled by the use of an organism, which has yet to be proved to cause infection to human beings, is it in the country's interest to suppress its use and to risk the increase of other and more serious infections?

London, W.C.1. THOMAS MCLACHLAN.

The Editor of the *Medical Journal of Australia* writes to say that as the result of enemy action copies of the *Lancet* for Jan. 4, March 15 and Aug. 16, 1941, have not reached him. These issues are now out of print and we should be glad to hear from any reader who has spare copies for these dates and would be willing to help us to complete the Australian journal's file.

Obituary

GEORGE McNEILL

M.B. EDIN., F.R.C.S.E.

Dr. George McNeill, who died on April 1, the day after his 64th birthday, graduated from Edinburgh University in 1902. Before joining the medical staff of Morningside Mental Hospital he voyaged to South America. He served under Clouston for three years, till his interest in surgery led him to become assistant to the professor of anatomy at St. Andrews. In 1908 he took his F.R.C.S.E. with anatomy as special subject, and the following year he went as surgeon to the Rio Tinto mines in Spain where he had a considerable experience of major surgery. He returned in 1912 and after a short period in general practice he was about to confine himself to surgery as a consultant when war broke out. McNeill served in France as surgeon in charge of a hospital in Etaples, and reached the rank of major before he was invalided as the result of an abdominal injury and appointed surgeon to Lord Derby Memorial Hospital at Winwick, Lancs. In 1920 he joined the staff of the Ministry of Pensions, first having charge of surgical cases at Orpington and later at Sidcup. In 1928 he became medical superintendent to the Ministry's hospital at Dunston Hill near Newcastle-on-Tyne where he continued to serve until his death.

Dr. McNeill created an atmosphere of dignity, kindliness and justice which was appreciated by his staff and patients. The hospital and his family occupied all his thoughts and energies. He treated his resident medical officers like sons, setting them a high standard of professional conduct, stimulating their postgraduate studies and following their professional and family careers with fatherly interest. His courtesy and quiet humour endeared him to his senior colleagues, and in these last months of failing health his fortitude and cheerfulness were never failing. Dr. McNeill leaves a widow with three sons of whom the two younger are studying medicine.

DAVID HENRIQUES de SOUZA

M.D., D.SC. LOND., F.R.C.P.

MANY doctors will remember Dr. de Souza, who died on March 25, for not only was he physician to the Westminster Hospital but he was also for many years lecturer in physiology at King's College where students from St. George's, Charing Cross and KCH attended his classes. Born into a Portuguese family which had lived for many generations in this country at Portsea and in the City of London, de Souza was educated at York Castle School, Jamaica, and University College, London. He graduated B.Sc., with first-class honours in physiology, in 1899, and qualified in medicine four years later. Appointed to a lectureship in physiology at Sheffield he returned to London to take up his post at King's where he soon realised that his main interest lay in clinical medicine, and he secured higher medical qualifications to join the staff of the Westminster first as registrar and later as a physician to the hospital and a teacher at the medical school, of which he was at one time dean. His appointment at King's allowed him to take a detached interest in consultant practice, and the hospital and its patients and students became his hobby. He was outstanding as a teacher in the wards, for his experience as an examiner both in medicine and physiology for the Conjoint Board and the Universities of London and Liverpool had persuaded him that students were not sufficiently trained to rely on their own observations, judgment and knowledge. He himself proudly claimed to be a consultant general physician and he deplored the increasing tendency to overspecialisation. He held that a physician should have enough clinical acumen and courage to make his diagnosis after examining a patient and to use pathological reports and X rays only as confirmation or refutation of his opinion.

In 1928 Dr. de Souza felt he could no longer combine his duties at King's and the Westminster and he gave up his lectureship in physiology but not his interest in the subject. At the time of his death he was busy with research on the administration of oxygen at St. Thomas's, and was about to begin work in a laboratory at the Westminster which had been equipped for him by the ladies committee. He was a barrister-at-law of the Middle Temple and of recent years had found much interest and amusement in his legal cases.

De Souza's quiet and somewhat formal manner hid genuine kindness. Nurses who were ill naturally gravitated to beds in his wards, and former students were apt to ask him to attend themselves and their own families in illness. He was a strong supporter of the higher education of women and of co-education in medicine. A fine musician, he had been an accomplished pianist. He had no interest in large gatherings or casual acquaintances and was happiest at work in the wards and his laboratory, or at home where he and his wife kept open house for their friends, many of whom were former students. One of these crystallises his epitaph thus: he was a remarkable man with the heart of a child."

ROBERT BROWN CAMPBELL

M.D. EDIN., F.R.C.P.E.

Dr. R. B. Campbell, who died at his home in Edinburgh on March 26, was for more than a quarter of a century medical superintendent of the Stirling District mental hospital at Larbert. He graduated in Edinburgh in 1895 and after serving as senior assistant at the Crichton Royal and the Montrose he was appointed to the Inverness District mental hospital in 1904. He was transferred to Larbert in 1908 and in 1912 took his M.D. and was elected to the Edinburgh fellowship. When the hospital was taken over by the Admiralty in 1917 Dr. Campbell was appointed consultant physician to the Royal Navy for nervous and mental diseases with the temporary rank of surgeon commander. In 1932 he became president of the Royal Medico-Psychological Association, which he had already served well as secretary of the Scottish division. He was also secretary and later chairman of the Scottish asylums pathological scheme and soon after he retired from Larbert in 1934 he joined the board of managers of the Edinburgh Royal Infirmary. Dr. Campbell always took a keen interest in the Royal College of Physicians of Edinburgh and for some years before his death was a member of the council. His wife died about three months ago and he leaves one daughter and three sons.

WACLAW STOCKI

M.D. POZNAN

Dr. Stocki, who died in Edinburgh on March 17 at the age of 40, was born in Waligrod, in Southern Poland. He studied medicine in the medical school at Poznan, and after he took his M.D. in 1928 he worked in the pathological department of the university as junior assistant and later as lecturer and senior assistant to the professor. After five years he had to give up this congenial appointment and start in general practice in Poznan. But he always remained in close contact with the pathological institute. His patients appreciated his sympathetic and human approach, and he represented the younger generation of doctors on the governing body of the medical association.

During the Polish campaign of 1939 Stocki was attached to a military hospital. Afterwards he went to Warsaw where he saw so much German cruelty and barbarity that he decided to escape and join the Polish Army in France. In January, 1940, he parted from his wife and mother and during the severe winter made his way through the ice and snow-covered Carpathian mountains to Hungary where he was interned. But he escaped and reached France where he joined the Polish Army and with this army he came to Britain.

Prof. A. T. Jurasz writes: "When the Polish Medical School was founded in Edinburgh in March, 1941, I had no hesitation in calling on Stocki to lecture in pathological histology for I knew his record in Poznan. He has done useful work for us and his death has left a gap which will be difficult to fill. Dr. Stocki died far from his own country, and it was not given to him to see the liberation of our country. But the scattering of Polish earth into his grave testifies that he rests in Polish soil, for which he gave up his home and his family and sacrificed everything."

Medical News

Royal College of Surgeons of England

At a meeting of the council of this college held on April 9, with Sir Alfred Webb-Johnson, the president, in the chair, the Jacksonian prize for 1941 was awarded to Mr. W. Bremner Highet for his essay on injuries to peripheral nerves, with especial reference to the late after-results. The subject for the prize for 1943 will be the treatment of acute intestinal obstruction. The John Tomes prize for 1939–41 was awarded to Dr. R. V. Bradlaw, L.D.S., for his researches into the microscopical structure of the dental tissue.

Dr. N. G. Horner, editor of the *British Medical Journal*, and Group-Capt. P. C. Livingston, consultant in ophthalmology to the R.A.F., were elected fellows under the charter which permits the council to elect annually to the fellowship, without examination, two members of twenty years' standing.

Mr. H. S. Souttar was re-elected a member of the court of examiners for a year. Mr. Eardley Holland was reappointed representative of the college on the Central Midwives Board.

A diploma of fellowship was granted to P. F. J. Hickinbotham (Birm. and Lond.) and diplomas in child health were granted jointly with the Royal College of Physicians to the following:—

Irene M. Bower, J. L. Emery, Monica M. M. M. Fisher, Margaret J. Graveson, Eleanor J. Herrin, Mary C. Hopper, A. M. Lester, Pearl Lyons, Zina E. Moncrieff, Anna E. Rides, L. M. Shorvon, Eleanor M. Singer, T. H. E. Taylor-Jones, Celia K. Westropp and Hermann Wolfsohn.

University of London

The following have been recognised as teachers of the university in respect of the posts mentioned:—

Dr. H. W. Breese, L.D.S., teacher of dental surgery at Middlesex Hospital medical school; Dr. Noel Harris, teacher of mental diseases at Middlesex Hospital medical school; Dr. H. L. Marriott, teacher of medicine at Middlesex Hospital medical school; Dr. A. L. Packham, L.D.S., teacher of dental surgery at Middlesex Hospital medical school; Dr. Eliot Slater, teacher of mental diseases at the Maudsley Hospital.

University of Dublin

At recent examinations at the school of physic, Trinity College, the following were successful:—

FINAL EXAMINATION FOR M.B., B.CH., B.A.O.

Medicine.—Cecilia J. Dippenaar and J. W. Dignan (second-class honours); A. M. Russell, K. J. Swanepoel, Andrew Aitken, Brenda R. Boydell, A. M. Jacobson, S. D. Killen, M. G. Jackson-Smyth, Lavinia F. Nightingale, J. W. van der Roos and P. J. Mentz.

Surgery.—Cecilia J. Dippenaar and Franziska G. Brill (second-class honours; Florella Starritt, Gladys M. Byers, D. M. Brooks, M. B. Flannagan, K. J. Swanepoel, C. W. Lloyd, G. F. Shaw, R. C. Rylance, T. J. N. Bates, S. B. Stein, T. A. H. Black, Muriel Eakins and A. G. Lee.

Midwifery.—F. S. Stewart, W. J. C. Hill and A. V. Poots (first-class honours); G. A. M. Lee, Heinz Scheyer, R. B. Brenan, Hannah E. Hinchcliff, J. M. T. Adamson, E. K. Holland, P. St. G. Anderson, J. J. Musgrave, Violet K. St. G. Breakey, Mary D. Moriarty, A. W. Pringle, K. M. Shaw, K. H. Anderson, Samuel Potgieter, G. R. Connolly and W. B. Martin (second-class honours); L. T. H. Mills, F. M. Lanigan-O'Keeffe, Helen U. Crossadale, C. K. Elliott, J. B. FitzSimons, N. L. Smith, D. K. Walshe, Catherine E. Craig, Dorothy W. M. Last, P. H. Seaton, J. D. O'Neill Donnellon, Joseph McNutt, O. D. Nightingale, R. H. C. Conyngham, H. H. B. Lamb, Margaret E. McClelland, J. M. Hanrahan, W. J. W. Wolfe and M. T. S. Conradie.

Society for Relief of Widows and Orphans of Medical Men

At a quarterly court of directors held on April 8, the president, Mr. V. Warren Low, being in the chair, the accounts for the year 1941 were approved. Of the two widows reported deceased one had been receiving grants for 32 years, £2,400 in all (member had paid in subscriptions £39 18s.); the other had been receiving grants for 23 years, £1,770 in all (member had paid £52 10s.). Membership is open to any registered medical man, who at the time of his election is residing within a twenty-mile radius of Charing Cross. Particulars from the secretary, 11, Chandos Street, London, W.1.

THE Central Midwives Board have re-elected Sir COMYNS BERKELEY as chairman for 1942–43.

Czech Medical

At special final examinations for the Czechoslovak MUDr. degrees held at the request of the Czechoslovak minister of the interior and education in London by the examining board in England of the Royal Colleges of Physicians and Surgeons the following were successful:—

Part I (pathology and bacteriology).—Frantisek Adler, Judita Fejerova, Imrich Gluck, Hugo Keszler, Alfred Kozdon, Zoltan Leffkovits, K. A. Machacek, Pavel Merory, Hanus Neuner, W. M. Politzer, Oldrich Prec, Lotar Sik, P. J. Sonnek, Vilem Taussig, Zdenek Urbanek, and Otto Weiss.

Part II (medicine).—Jan Glaser, Jan Kudrna, Josefina Liebsteinova, Velimir Macharacek, M. K. Martischnig, Charles Novak, Vladimir Pekarek, Pavel Retter, K. J. Susat, Walter Tausig, and Josef Voracek.

Harveian Society of London

Colonel L. E. H. Whitby will deliver the Harveian lecture to this society at 11, Chandos Street, London, W.1, on Monday, May 4, at 4 P.M. He will speak on the hazards of transfusion.

Medical Society for the Study of Venereal Diseases

A meeting of this society will be held at 2 P.M. on April 25, at 11, Chandos Street, London, W.1, when Major S. M. Laird will open a discussion on the need for further powers to deal with sources of infection, contacts and defaulters.

Imperial Cancer Research Fund

The annual general meeting will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on April 22, at 2.30 P.M.

Royal Sanitary Institute

A meeting of the institute will be held at Bradford on May 1 and 2, when Dr. John Gibson, medical officer of health for Huddersfield, will open a discussion on the regionalisation of hospitals. On May 9 the institute will meet at Newcastle-on-Tyne, when Dr. Ian McCracken will speak on administrative and practical problems raised by the scabies order.

Imperial Chemical (Pharmaceuticals) Ltd.

A private limited company has been formed under this name as a subsidiary of Imperial Chemical Industries Ltd. The research work of ICI (Dyestuffs) Ltd. in the higher organic chemical field has for some years included the closely related branch of chemical therapeutics and several important products, including some previously only obtainable from foreign sources, are already on the market. The new company is the outcome of these developments.

Medical Casualties

In recent casualty lists Captain G. R. Royston, M.D. Lond., R.A.M.C., was posted as wounded and Lieutenant John McSorley, M.B. N.U.I., R.A.M.C., as prisoner of war.

Since the fall of Singapore the following R.A.M.C. officers have been reported missing: Colonel C. F. Burton, M.R.C.S., Major G. A. Gauld, M.R.C.S., Captain J. G. Jesson, M.B. Lond. and Captain E. D. H. Williams, M.B. Lond.

Medical Planning at Sheffield

The first meeting of a discussion group which has been formed by the assistants and residents of Sheffield hospitals was held on April 7 at the Royal Hospital. Dr. A. E. Barnes, who was in the chair, introduced a discussion on the future of British hospitals. Dr. E. G. G. Rhind read a paper on regionalisation, which was followed by a general discussion. The secretary explained that the group has been formed to provide the more recently qualified medical men and women in Sheffield with an opportunity of expressing their views on medical reorganisation.

Conference on the Health of the Worker

The Labour Research Department in coöperation with the Socialist Medical Association are holding a conference at the Conway Hall, Red Lion Square, London, W.C.1, on Saturday, May 16, at 2.30 P.M., under the chairmanship of Mr. Jack Tanner, president of the Amalgamated Engineering Union. Dr. T. O. Garland will open a discussion on the health of the war worker in which speakers from various industries will afterwards take part. Further information may be had from the secretary of the department, 6, High Holborn, W.C.1.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

Notes, Comments and Abstracts

STUDENTS' BOARD AND LODGING

UP to now the Ministry of Health has not contributed to the cost of billeting, boarding or lodging students except in special circumstances when, for instance, they have been needed to help in the reception of casualties. The minister has now decided to pay for the board and lodging of a fixed quota of resident students, allocated by agreement between the hospital authorities and the group officer, for each hospital within the emergency scheme found to require them. The object will be to ensure a small nucleus of resident students who will be available to help in special transfusion and resuscitation teams, to act as stretcher-bearers, porters or otherwise in the reception and treatment of casualties, or, in the case of senior students, to act as house-officers where ordinary house posts have been abolished. For short periods of exceptional pressure this quota may be expanded, but students may only be included if they have been helping in the reception or treatment of casualties "materially and necessarily during the whole period for which the costs are claimed." Fire-watching and ARP duties will not count as helping for this purpose. The ministry will contribute up to £100 a year towards the board and lodging of any senior student acting as junior house-officer.

A DIETETIC READY RECKONER

THE research laboratories of Vitamins Ltd. have issued a food value calculator[1] which magnificently simplifies the work of evaluating family and institutional diets in terms of calories, proteins, inorganic elements and vitamins. Like a planisphere, it consists of two concentric cards, the smaller pivoting on the larger. The position of the smaller is adjusted so that the amount of a particular food eater appears in a slit in the upper card and immediately beneath appear figures for protein, calcium, available iron, vitamins A, B_1, C and calories in that amount. Thus if I eat 4 oz. sprats I can read off at a glance that I have consumed 20 g. of protein, 720 mg. of calcium, 3 mg. of iron, 112 I.U. vitamin A, 20 I.U. vitamin B_1, no vitamin C, and material to yield 100 calories. The calculator is designed mainly for large-scale dietary surveys and would give less accurate results in calculating a diet for a solitary bachelor. The laboratory worker, of course, will shy at the thing, for naturally it cannot take account of the minutiæ with which he is accustomed to deal, but it should be in the hands of every dietitian and in every kitchen where people are beginning to think in terms of food values, and those with old-fashioned families should find it a useful piece of domestic apparatus.

MICROSCOPES FOR RUSSIAN VETS.—Sir Robert Gower, chairman of the RSPCA, writes that a hundred microscopes are needed by the Soviet Army Veterinary Corps for the treatment of horses suffering from disease as a result of the strenuous campaign. He asks that anyone who has an unwanted microscope should present it to the RSPCA for transmission to Russia. The appeal has the approval of the British Ministry of Supply. The address of the RSPCA is 105 Jermyn Street, London, S.W.1.

ROYAL SOCIETY OF MEDICINE.—The section of therapeutics and pharmacology of this society will meet on Tuesday, April 21, at 2.30 P.M., when Dr. J. C. Bridge, Sir David Munro, Dr. Catherine Swanston, Dr. R. E. Lane and Prof. T. B. Davie will open a discussion on TNT poisoning. The general meeting of fellows will take place at 5 P.M. on the same day. On April 23, Mr. Geoffrey Parker will read a paper to the section of urology on hæmospermia. Miss M. E. Flambert, deputy chief nursing officer of the Ministry of Health, will open a discussion on the future of public-health nursing at the section of epidemiology and state medicine on April 24, at 2.30 P.M. Other speakers will include Miss E. C. Phillips (America), Miss I. Hawkins (New Zealand), Miss Eleanor Jones (Canada) and Dr. Nicholas Gebbie, medical officer of health for Hull. The section for disease in children is holding a meeting at the children's unit of Windsor Emergency Hospital on April 25, at 2.30 P.M.

1. Obtainable from Vitamins Ltd. 23, Upper Mall, Hammersmith, London, W.6.

INFECTIOUS DISEASE IN ENGLAND AND WALES

WEEK ENDED MARCH 28

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1307; whooping-cough, 1504; diphtheria, 894; paratyphoid, 5; typhoid, 9; measles (excluding rubella), 3188; pneumonia (primary or influenzal), 1258; puerperal pyrexia, 181; cerebrospinal fever, 198; poliomyelitis, 5; polio-encephalitis, 3; encephalitis lethargica, 6; dysentery, 125; ophthalmia neonatorum, 105. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on March 25 was 1446, including scarlet fever, 133; diphtheria, 187; measles, 101; whooping-cough, 462; enteritis, 82; chicken-pox, 50; erysipelas, 41; mumps, 70; poliomyelitis, 1; dysentery, 25; cerebrospinal fever, 39; puerperal sepsis, 24; enteric fevers, 7; german measles, 5; malaria, 8; other diseases (non-infectious), 114; not yet diagnosed, 97.

Deaths.—In 126 great towns there were no deaths from scarlet fever, 3 (0) from enteric fevers, 4 (1) from measles, 10 (2) from whooping-cough, 23 (0) from diphtheria, 34 (5) from diarrhœa and enteritis under 2 years, and 42 (5) from influenza. The figures in parentheses are those for London itself.

Liverpool, Exeter and Cardiff each reported 1 death from an enteric fever, and there was also 1 fatal case in Greater London. Middlesbrough had 3 deaths from diphtheria.

The number of stillbirths notified during the week was 251 (corresponding to a rate of 38 per thousand total births), including 31 in London.

Appointments

DODD, WILLIAM, M.D. LPOOL, M.R.C.P.: deputy M.O.H. and school M.O. for the Isle of Ely.

FRIEDMANN, ERNEST, M.D. BERLIN, L.R.C.P.E.: obstetric and gynæcological registrar at the Royal Free Hospital.

HAMILL, MARY, M.B. N.U.I.: R.M.O. at the maternity and child welfare department of the Babies' Hospital, Canwell Hall, Birmingham.

PRICEE, L. W., M.D. CAMB.: director of the pathological department at the Royal Cancer Hospital (Free), London.

RICHARDSON, F. C. RUTH, L.R.C.P.: R.M.O. at Three Counties Hospital, Arlesey, Beds.

TYTLER, JESSIE, M.B. GLASG., D.P.H.: temp. deputy M.O.H. for Chester.

WALKER, J. Z., M.B. GLASG., D.M.R.E., F.F.R.: director of radiotherapy for Lincolnshire.

The following have been appointed medical referees for cases of dermatitis under the Workmen's Compensation Act:—

HALDIN-DAVIS, H. D., D.M. OXFD, F.R.C.P., F.R.C.S., for circuits 45, 47–50 and 56;

MACCORMAC, HENRY, M.D. EDIN., F.R.C.P., for circuits 27, 34, 35, 37–50, 56 and 58; and

SEMON, H. C., D.M. OXFD, F.R.C.P., for circuits 27, 34, 35, 37–44, 46 and 58.

Births, Marriages and Deaths

BIRTHS

BROOKE.—On April 5, in London, the wife of Dr. Bryan Brooke—a daughter.

CHITNIS.—On April 4, in Birmingham, the wife of Dr. C. N. Chitnis, of Castle Bromwich—a son.

DRAKE-LEE.—On April 7, at Kettering, the wife of Dr. W. Drake-Lee—a son.

FAIRBAIRN.—On April 8, the wife of Captain A. S. Fairbairn, R.A.M.C.—a son.

FERGUSSON.—On April 11, at Edgware, the wife of Mr. J. D. Fergusson, F.R.C.S.—a son.

MILLER.—On April 12, at Newcastle-on-Tyne, to Dr. Sheila Miller (*née* Franklin), the wife of Dr. Frederick Miller—a son.

PORTER.—On April 10, at Watford, the wife of Captain D. Paterson Porter, R.A.M.C.—a son.

PRIDIE.—On April 5, to Dr. Joanna Pridie (*née* Egerton), wife of Mr. Kenneth Pridie, F.R.C.S., of Bristol—a son.

VICKERS.—On April 8, the wife of Surgeon Lieut.-Commander H. R. Vickers, R.N.V.R., of Sheffield—a daughter.

WAINWRIGHT.—On April 7, the wife of Mr. Denys Wainwright, F.R.C.S., of Stoke-on-Trent—a daughter.

WATSON.—On April 11, in London, the wife of Flight-Lieutenant John Watson, M.B.—a daughter.

MARRIAGES

BELDON—GAUNT.—On April 7, at Calverley, Edgar Beldon, lieutenant, R.N.V.R., to Maria Lambert Gaunt, M.B., of Duchy Road, Harrogate.

HOBBS—KENNEDY.—On April 11, at Oxford, Henry Hobbs, F.R.C.S., to Jean Kennedy.

LENTON—NETHERCOT.—On April 13, at Bristol, Peter Henry Lenton, captain R.A.M.C., to Jean Nethercot.

DEATHS

COX.—On April 9, Edwin Marion COX, M.D. COLUMBIA, L.S.A., of Holland Street, London, W.8.

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List of Acne Vaccines, with contents per c.c.

	(a)	*(b)	(c)	(d)	*(e)	*(f)
S. aureus:	250 million,	500 million,	125 million,	250 million,	500 million,	10 million
B. acnes:	10 ,,	20 ,,	125 ,,	250 ,,	500 ,,	

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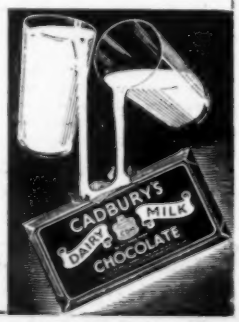

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BRITISH POSTGRADUATE MEDICAL SCHOOL
(UNIVERSITY OF LONDON)

SURGICAL CARE OF THE SOLDIER IN TRAINING
27th April to 1st May, 1942

Monday, 27th April	10 A.M.	Abdominal Emergencies ..	Lieut.-Col. W. Underwood, F.R.C.S.
	2 P.M.	Hernia and its Management	Surgeon Rear-Admiral C. P. G. Wakeley, C.B., F.R.C.S., F.R.A.C.S., F.A.C.S.
	3 P.M.	Strangulated Hernia ..	Mr. R. H. Franklin, F.R.C.S.
Tuesday, 28th April	10 A.M.	Genito-urinary Problems..	Mr. E. W. Riches, M.C., F.R.C.S.
	12.15 P.M.	Genito-urinary Instruments and their Care.	Mr. E. W. Riches, M.C., F.R.C.S.
	2 P.M.	Minor Operations: Cadaver Demonstration.	Mr. A. K. Henry, M.B., M.Ch., F.R.C.S.
Wednesday, 29th April	10 A.M.	Self-inflicted Wounds and Suicide.	—
	11 A.M.	Rectal Conditions	Mr. R. H. Franklin, F.R.C.S.
	2 P.M.	Enlarged Glands; Surface Swellings.	Prof. G. Grey Turner, LL.D., D.Ch., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S.
Thursday, 30th April	10 A.M.	Varicose Veins and their Complications.	Mr. R. H. Franklin, F.R.C.S.
	2 P.M.	Boils, Carbuncles, Cellulitis, General Sepsis.	Mr. G. C. Dorling, F.R.C.S.
Friday, 1st May	10 A.M.	Foot Troubles; Sprains ..	—
	2 P.M.	Recrudescence of Old Infections, &c., Sinuses.	Prof. G. Grey Turner, LL.D., D.Ch., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S.

The fee for the Course will be one guinea, but no fee will be charged in the case of officers of the Armed Forces who are nominated for the course by their respective Director-Generals. Applications for admission should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12.

Further War Surgery Courses will commence as follows:—
WAR SURGERY OF THE ABDOMEN .. .. MONDAY, 11TH MAY, 1942.
WAR MEDICINE .. .. MONDAY, 1ST JUNE, 1942.
TREATMENT OF FRACTURES (limited to 40) MONDAY, 15TH JUNE, 1942.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, May 11th, June 8th, July 13th, 1942; MEDICINE, May 18th, June 15th, July 20th, 1942; MIDWIFERY, May 19th, June 16th, July 21st, 1942.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

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Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

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At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

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The house stands high with spacious balconies and extensive views of the South Devon Coast. Beautiful garden. Own Dairy in 25 acres. Private road to beach. There is also a charming house, EBWORTHY, MANATON, DARTMOOR, situated in 20 acres, 1100 ft. up for bracing moorland air.

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CHISWICK HOUSE,

PINNER, MIDDLESEX.

Telephone: PINNER 234.

A Private Hospital for the Treatment and Care of Mental and Nervous Illnesses in both Sexes.

A modern country house, 12 miles from Marble Arch, in attractive and secluded surroundings. Fees from 10 guineas per week inclusive. Cases under Certificate, Voluntary and Temporary Patients received for treatment.

DOUGLAS MACAULAY, M.D., D.P.M.

CITY OF LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Ladies and Gentlemen received for treatment under certificates, and without certificates as either VOLUNTARY or TEMPORARY PATIENTS, at a weekly fee of £2 9s., and upwards.

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All forms of treatment available. Fees from 4 gns. per week upwards according to requirements. Vacancies occasionally exist at reduced fees on the recommendation of the patient's own physician.

Apply to Dr. J. A. SMALL. Telephone: Norwich 20080

Telephone: WELbeck 2728 Telegrams: "ASSISTIAMO, LONDON"

For MEDICAL, SURGICAL, and

MENTAL NURSES

Male or Female

THE NURSES' ASSOCIATION

In conjunction with the MALE NURSES' ASSN.

29, YORK ST., BAKER ST., LONDON, W.1

Mrs. MILLICENT HICKS, *Superintendent* W. J. HICKS, *Secretary*

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind.

Terms moderate. Apply to Resident Medical Superintendent. Telegrams: ADAM WEST MALLING. Telephone No. 2: MALLING.

THE MAGHULL HOMES FOR EPILEPTICS (Inc.)

MAGHULL (near LIVERPOOL)

FARMING and OPEN AIR OCCUPATION for PATIENTS

A few vacancies in 1st and 2nd Class Houses.

FEES: 1st Class (men only) from £3 per week upwards.
2nd Class (men and women) 37/6 per week.

For further particulars apply: C. EDGAR GRISEWOOD, A.C.A.
Secretary, 29, Exchange Street East, Liverpool, 2

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON—Obstetrics (A) on the 1st June, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, Shepherd's Bush, W.12, not later than Tuesday, 5th May, 1942.

British Postgraduate Medical School.

(UNIVERSITY OF LONDON.)

Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN (B1). Applicants should have held house appointments. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Preference will be given to candidates holding an M.D. degree or the diploma of M.R.C.P., or who have special experience in Tuberculosis. The appointment will be in the first place for six months, and the salary is at the rate of £250 per annum, with the usual residential emoluments. An additional allowance will be made if appointed to take charge of the Tuberculosis Clinic at the Hospital.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by three recent testimonials, should be addressed to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 28th April, 1942.

British Postgraduate Medical School.
(UNIVERSITY OF LONDON.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of Two HOUSE PHYSICIANS (A) on the 1st June, 1942, including R practitioners within three months of qualification. The appointment is for six months and carries a salary of £105 per annum, plus the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of three recent testimonials, should be sent to the DEAN, British Postgraduate Medical School, Ducane-road, W.12, not later than Tuesday, 5th May, 1942.

University of London.

The Senate invite applications for the UNIVERSITY READERSHIP IN ORGANIC CHEMISTRY tenable at LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN. Salary £500–£700 a year.

Applications must be received not later than first post on Tuesday, 12th May, 1942, by the ACADEMIC REGISTRAR, University of London, Richmond College, Richmond, Surrey, from whom further particulars should be obtained.

Examining Surgeons:
FACTORIES ACT, 1937.

The following appointments as Examining Surgeon under the Factories Act, 1937, are vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, 28, Broadway, London.

District	*County*	*Latest date for receipt of application*
GROSMONT ..	YORK	21st April, 1942
TOWCESTER ..	NORTHAMPTON ..	21st April, 1942
MASHAM ..	YORK	21st April, 1942

Examining Surgeons:
FACTORIES ACT, 1937.

The following appointments as Examining Surgeons under the Factories Act, 1937, are vacant.

Applications should be sent to the CHIEF INSPECTOR OF FACTORIES, 28, Broadway, London, S.W.1.

District	*County*	*Latest date for receipt of application*
DALRY	AYR ..	28th April, 1942.
DUNS AND CHIRNSIDE ..	BERWICK ..	28th April, 1942.

Soho Hospital for Women
AND FIRST-AID POST, Soho-square, W.1.

Applications are invited from fully qualified Men and Women (including R practitioners who now hold A posts) for the combined post of RESIDENT MEDICAL OFFICER (B2) to the Hospital and SENIOR MEDICAL OFFICER to the First-Aid Post for a period of six months beginning 1st May, 1942. Salary approximately £150 per annum, with full board and lodging.

Applications should be sent as soon as possible to—
J. P. HEMING, Secretary.

The Salvation Army,
THE MOTHERS' HOSPITAL, Lower Clapton-road, Clapton, E.5.

Applications are invited from medical Women for the post of SENIOR RESIDENT MEDICAL OFFICER (B2), vacant 1st June, 1942. Salary £150 per annum, with board, residence, and laundry. The appointment is for six months or twelve months. Applications are also invited for the post of JUNIOR RESIDENT MEDICAL OFFICER (A), vacant 1st June, 1942. Salary £80 per annum, with board, residence, and laundry. The appointment is for six months.

Applications, with testimonials, to be sent to the Superintendent not later than 29th April, 1942.
FRED HAMMOND, Superintendent.

Dreadnought Seamen's Hospital,
GREENWICH.

Applications are invited from British Male registered medical practitioners for the appointment of HOUSE PHYSICIAN (B2), to become vacant on 1st May, including R practitioners who now hold A posts when appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and accompanied by copies of three recent testimonials, should be sent immediately to: F. A. LYON, Secretary.
Dreadnought Seamen's Hospital, Greenwich, S.E.10.

Tilbury Hospital, Tilbury, Essex.
(SEAMEN'S HOSPITAL SOCIETY.) (116 Beds.)

Applications are invited from British Male registered practitioners for the appointment of HOUSE OFFICER (A), falling vacant on 1st May, 1942, including R practitioners within three months of qualification when appointment will be for six months. Salary at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and testimonials, to be sent immediately to: F. A. LYON, Secretary. Seamen's Hospital Society, Greenwich, S.E.10.

Royal National Orthopædic Hospital,
234, Great Portland-street, W.1.

Applications are invited from registered medical practitioners, including R practitioners holding A posts, for the appointment of RESIDENT HOUSE SURGEON (B2) to commence 1st May, The appointment is for six months. Salary £200 per annum. with board, quarters, laundry, &c.

Applications, stating age, nationality, qualifications, and previous experience, with copies of testimonials, should be sent to the SECRETARY not later than 22nd April.

Princess Louise Kensington Hospital
FOR CHILDREN,
St. Quintin-avenue, North Kensington, W.10.

RESIDENT MEDICAL OFFICER (B2) required at end of April. Salary subject to experience, with a minimum of £120 to £200. R practitioners holding A posts may apply when appointment will be limited to six months.

Applications to the SECRETARY.

The Hospital for Sick Children,
Great Ormond-street, London, W.C.1.

Vacancies for Two HOUSE PHYSICIANS (B2) and Two HOUSE SURGEONS (B2) will occur on the 1st July, 1942. Applications are invited from registered medical practitioners, Male and Female, including R practitioners who hold A posts. The appointments are for six months. Salaries at the rate of £200 per annum, with full residential emoluments.

Further particulars and form of application, which must be returned not later than the 25th May, 1942, are obtainable from: HERBERT F. RUTHERFORD, Secretary.
April, 1942.

County Council of Durham.

Applications are invited from married and single Women for the post of TEMPORARY ASSISTANT WELFARE MEDICAL OFFICER at a commencing salary of £600 per annum, rising by annual increments of £25 to £700 per annum, plus cost-of-living bonus. Travelling allowance will be paid by the County Council in accordance with a scale to be approved from time to time.

The appointment will be subject to the regulations for the time being of the County Council relative to the payment of salary in the case of sickness, and will be terminable by one month's notice on either side. The appointment will be also subject to the following conditions:—

(1) The officer appointed must be a registered medical practitioner over the age of twenty-five years; must devote the whole of her time to the duties of the office; and must not engage in private practice.

(2) She should either have had a previous appointment as Medical Officer of an antenatal clinic, with the approval of the Minister of Health, or have had at least three years' experience in the practice of her profession and special experience of practical midwifery and antenatal work. The holding of a Diploma in Public Health will be deemed an additional qualification for the post.

(3) She will be subject to the directions of the County Medical Officer of Health.

(4) She will be required to reside in Durham City, or such other place as required by the Council.

(5) She must be prepared to undertake any duties in connexion with the Health Services of the County Council, including attendance at Birth Control Clinics.

(6) She must be prepared, if called upon, to act as locum tenens for other members of the medical staff of the County Medical Officer of Health.

(7) The candidate will be required to pass the County Council's medical examination, and will be subject to the provisions of the Local Government Superannuation Act, 1937.

Applications, endorsed "Assistant Welfare Medical Officer," with copies of not more than three recent testimonials, should be addressed to the County Medical Officer of Health, Shire Hall, Durham, and must be received by him not later than Saturday, 2nd May, 1942.

J. K. HOPE, Clerk of the County Council.
Shire Hall, Durham, 11th April, 1942.

Royal Berkshire Hospital, Reading.

Applications are invited from registered medical practitioners (Male) for the appointment of CASUALTY OFFICER (A), which falls vacant on 30th May, 1942, including R practitioners within three months of qualification when appointment will be for a period of six months. Salary at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent immediately to—
H. E. RYAN, Secretary and House Governor.

Aberdeen Royal Mental Hospital.

Applications for the position of TEMPORARY ASSISTANT PHYSICIAN (B1) are invited. Previous mental hospital experience preferred but not essential. Salary £400 per annum, with board, rooms, and laundry. Suitably qualified R practitioners holding B2 or B1 posts may apply but must first obtain the sanction of the Scottish Central Medical War Committee.

Applications, giving age and experience, with copies of testimonials, should be sent to the PHYSICIAN-SUPERINTENDENT.
4th April, 1942.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £630 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

City of Manchester.

WITHINGTON HOSPITAL. (1150 Beds.)

(1) TEMPORARY APPOINTMENT OF RESIDENT ASSISTANT MEDICAL OFFICER (B1) TO THE TUBERCULOSIS WARDS.

Applications are invited from registered medical practitioners, Male or Female, for the above temporary appointment, which will become vacant at the end of June.

The tuberculosis wards contain approximately 150 Beds and are used for the diagnosis and treatment of all types of pulmonary tuberculosis within the City.

(2) TEMPORARY APPOINTMENT OF RESIDENT OBSTETRICAL OFFICER (B1).

Applications are invited for the above temporary appointment from Male and Female registered medical practitioners. Candidates must have had previous experience in obstetrics and gynæcology, and preference will be given to those holding a higher qualification. The department in the Hospital contains 130 midwifery Beds and 32 gynæcological Beds.

Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply for these vacancies.

Each post carries a basic salary commencing at £350 per annum, rising by annual increments of £25 to a maximum of £450, with board, residence, and laundry in addition. A temporary cost-of-living wages award is payable in addition to the basic salaries.

Each appointment is subject to the Manchester Corporation conditions of service.

Full information of either post and forms of application may be obtained from the Medical Officer of Health, Hospitals Administration Section, P.O. Box 399, Town Hall, Manchester, 2, and all applications must be received by him not later than 4th May, 1942.

Canvassing in any form is prohibited.

R. H. ADCOCK, Town Clerk.

Town Hall, Manchester, 2, 10th April, 1942.

Huddersfield Royal Infirmary.

(321 Beds.)

Male CASUALTY OFFICER (B2) required to commence duty as soon as possible. R practitioners who now hold A posts are invited to apply. Salary £200 per annum, with board, residence, and laundry. Appointment for six months, subject to renewal for a similar period. To R practitioners the appointment will be limited to six months. The Hospital is officially recognised for the surgical practice required of non-members before admission to the Final Fellowship Examination of the Royal College of Surgeons of England.

Applications, with copies of three recent testimonials, to be addressed immediately to—

H. J. JOHNSON, General Superintendent and Secretary.

County Borough of Blackburn.

Applications are invited from registered medical practitioners (Male or Female), including R practitioners within three months of qualification, for the post of RESIDENT JUNIOR ASSISTANT MEDICAL OFFICER (A) at QUEEN'S PARK HOSPITAL AND INSTITUTION, Blackburn, at a salary of £200 per annum, together with board, apartments, and attendance. The appointment will be limited to a term not exceeding one year, or if an R practitioner is appointed a period of six months.

Further particulars may be obtained from the Public Assistance Officer, Cardwell-place, Blackburn, to whom applications, stating age, qualifications, and experience, accompanied by copies of three recent testimonials, must be sent.

Blackburn. CHAS. S. ROBINSON, Town Clerk.

Clayton Hospital, Wakefield.

Applications are invited from registered medical practitioners (Male) for the appointment of a JUNIOR HOUSE SURGEON (A), to become vacant immediately. R practitioners within three months of qualification may apply. The appointment is for six months. Salary at the rate of £150 per annum, with residence, board, and laundry.

Applications, accompanied by not more than three testimonials, to be sent immediately to—

T. F. W. MACKEOWN, Secretary-Superintendent.

20

Lancashire County Council.

The Lancashire County Council propose to appoint a Whole-time TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER (Male or Female) and invite applications from registered medical practitioners who should possess a Diploma in Public Health.

The duties of the post include the medical inspection of school-children, maternity and child welfare work, general public health work, and such other duties as may from time to time be imposed by the County Council.

The salary will be at the rate of £800 per annum, together with allowances for travelling, &c.

Applications must be made upon a form which can be obtained, together with further particulars, from the County Medical Officer of Health, School Medical and Child Welfare Department, County Offices, Preston, to whom the completed forms should be returned not later than the 2nd May, 1942. All communications must be endorsed "Assistant County Medical Officer."

Any form of canvassing is strictly forbidden and will disqualify. GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, April, 1942.

Lancashire County Council.

PUBLIC HEALTH DEPARTMENT.

COUNTY HOSPITAL, WHISTON, Near PRESCOT.

Applications are invited from registered medical practitioners (Male or Female) for the appointment of RESIDENT MEDICAL OFFICERS (B2), including R practitioners who now hold A posts. The Hospital is a general hospital dealing with acute work and comprises 1300 Beds. Two posts are vacant, and in one case experience in maternity work will be an advantage. To R practitioners the appointment will be limited to six months; otherwise the successful applicants will be eligible for reappointment for a further period of six months. The salary is at the rate of £250 per annum, with the usual residential emoluments.

The persons appointed will be required to take up duty as early as possible. Forms of application may be obtained from the County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, to whom all applications, accompanied by copies of not more than two recent testimonials, must be forwarded not later than Monday, the 4th May, 1942.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 10th April, 1942.

City of Leicester.

CITY GENERAL HOSPITAL, Gwendolen-road.

Applications are invited from registered medical practitioners, including R practitioners who now hold A posts, for the appointment of a RESIDENT MEDICAL OFFICER (B2), mainly for medical duties. If held by an R practitioner the appointment will be limited to six months; otherwise it will be renewable for a further six months. Salary is at the rate of £300 per annum, with full residential emoluments. Preference will be given to those with, or reading for, higher qualifications.

Applications (on forms supplied), accompanied by copies of three recent testimonials, must be submitted as soon as possible, endorsed "R.M.O.," and addressed to—

E. K. MACDONALD, Medical Officer of Health.

Health Department, Grey Friars, Leicester, April, 1942.

Blackburn and East Lancashire Royal

INFIRMARY. (244 Beds—5 Residents.)

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), including R practitioners within three months of qualification when appointment will be for a period of six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as early as possible to—

T. DEWHURST, General Superintendent and Secretary.

Royal Infirmary, Blackburn.

The Hospital for Sick Children,
NEWCASTLE UPON TYNE.

Applications are invited from registered medical practitioners, Male and Female, for the following appointments which will become vacant on 1st May, 1942 :—

(*a*) HOUSE PHYSICIAN (B2). R practitioners holding A posts may apply when appointment will be limited to six months. Salary at the rate of £150 per annum, with full residential emoluments.

(*b*) HOUSE SURGEON (A). R practitioners within three months of qualification may apply when the appointment will be for a period of six months. Salary at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, to be sent to—

J. B. CAIRNCROSS, C.A., House Governor and Secretary.

March, 1942.

Royal Victoria Infirmary, Newcastle
UPON TYNE.

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1) to the ORTHOPÆDIC DEPARTMENT, to become vacant on 1st June, 1942. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £300 per annum, resident.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent not later than Saturday, 2nd May, 1942, to—

A. W. SANDERSON, House Governor.

City of Nottingham.
CITY ISOLATION HOSPITAL AND SANATORIUM.

Applications are invited for the post of RESIDENT MEDICAL OFFICER (B2), unmarried, Male or Female, at the above Hospital of approximately 200 Beds. Salary £250 per annum (plus war bonus), together with board, residence, and laundry. Suitably qualified R practitioners holding A posts may apply when appointment will be for a period of six months; otherwise will be renewable for a further six months. Preference will be given to candidates who have held a resident appointment in a general hospital. The holding of the D.P.H., although not essential, would be an additional qualification.

Application forms, to be obtained from me, should be returned forthwith. J. E. RICHARDS, Town Clerk.

The Guildhall, Nottingham, April, 1942.

Cheshire County Council.
CLATTERBRIDGE (COUNTY) GENERAL HOSPITAL, BEBINGTON, WIRRAL.

JUNIOR RESIDENT ASSISTANT MEDICAL OFFICER (B2).

Applications are invited from registered medical practitioners (Male), including R practitioners holding A posts, for the above appointment at a salary of £250 per annum, together with the usual residential allowances. To R practitioners appointment will be limited to six months, otherwise it may be renewed for a further period of six months. There is a non-Resident Medical Superintendent, a Resident Deputy Medical Superintendent, and a Consulting Staff from Teaching Hospitals.

Applications to be made on forms obtainable from the undersigned, and returned not later than the 30th April, 1942.

IAN MACKAY, County Medical Officer of Health.

County Public Health Department, 24, Nicholas-street, Chester.

Hampshire County Council.
THE COUNTY COUNCIL HOSPITAL, ST. PAUL'S HILL, WINCHESTER.

RESIDENT HOUSE OFFICER (Male or Female) required at this Hospital at a salary of £150 per annum (A post). R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise may be extended to twelve months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three testimonials, should be sent not later than the 1st May to—

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

York County Hospital.
(222 Beds.)

Applications are invited from registered medical practitioners for the following appointments, which fall vacant on the 1st May, 1942: HOUSE SURGEON (A), for which R practitioners within three months of qualification may apply; and ORTHOPÆDIC HOUSE SURGEON AND CASUALTY OFFICER (B2), for which R practitioners holding A posts may apply. To R practitioners appointments will be for a period of six months. Salary is at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

J. R. MACKRILL, Secretary.

City of Birmingham.
MATERNITY AND CHILD WELFARE DEPARTMENT.

TEMPORARY WOMEN MEDICAL OFFICERS are required for a period commencing on 8th May, 1942, and terminating on 27th October, 1942, and also for the duration of the war. The work includes attendance at antenatal clinics and children's clinics. Applicants should have had experience in work with mothers and children, including a six months' resident post in a maternity hospital and in a children's hospital. The salary offered is £10 per week.

Applications, endorsed "Temporary Medical Officer," and accompanied by copies of three recent testimonials, to be made on a form obtainable from the MEDICAL OFFICER OF HEALTH, Council House, Birmingham, 3, and returned to him on or before 2nd May, 1942.

Birmingham and Midland Hospital
FOR WOMEN.

Applications are invited from registered medical practitioners (Male or Female) for the appointment of HOUSE SURGEON (B2), including R practitioners who now hold A posts. The appointment is for six months from 1st June, 1942. Salary to be at the rate of £100 per annum.

Applications, with full particulars and copies of testimonials, to be sent not later than 2nd May to: HUGH C. ASTON, C3, Kenilworth-court, Hagley-road, Birmingham, 16.

Bootle General Hospital,
Linacre-lane, BOOTLE, LIVERPOOL, 20. (123 Beds.)

CASUALTY OFFICER.

Applications are invited from registered medical practitioners, Male and Female, for the above B2 appointment, including R practitioners who now hold A posts. Appointment is for a period of six months from 1st May, 1942, and salary at the rate of £175 per annum, with full residential emoluments.

Applications, stating age, nationality, qualifications, experience, and present position, and accompanied by copies of three recent testimonials, should be sent immediately to the SUPERINTENDENT.

Royal Manchester Children's Hospital,
PENDLEBURY, Near MANCHESTER.

Applications are invited for the post of RESIDENT SURGICAL OFFICER (B1). Salary £150 per annum. The appointment is for a period of six months commencing 1st June, 1942. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply.

Applications, stating age, and accompanied by copies of not more than three recent testimonials, to be sent to the undersigned not later than Monday, 4th May. Canvassing, directly or indirectly, may disqualify.

By Order.

H. HEARDMAN, General Superintendent and Secretary.

Isle of Ely County Council.
TEMPORARY ASSISTANT COUNTY MEDICAL OFFICER.

Applications are invited from duly qualified persons of either sex for the above-mentioned appointment, at a salary of £600 per annum, rising by annual increments of £25 to £700 per annum. Experience in mental deficiency or refraction work will be considered an advantage. The provision of a car will be required, and travelling expenses will be allowed in accordance with the Council's scale.

The officer appointed will be required to devote his or her whole time to the duties involved. The appointment will be for the duration of the war, or for such other period as may be necessary, and will be subject to one month's notice on either side.

Applications, accompanied by copies of not more than two recent testimonials, should reach the County Medical Officer County Hall, March, not later than the 30th April, 1942.

Canvassing, directly or indirectly, will disqualify.

R. F. G. THURLOW, Clerk of the County Council.

County Hall, March, 13th April, 1942.

City Hospital, Chester.

Applications are invited from registered medical practitioners (including R practitioners within three months of qualification) for the appointment of JUNIOR RESIDENT MEDICAL OFFICER (A) on the resident staff of the above General Hospital (200 Beds). The appointment will be for six months but terminable on one month's notice on either side. Salary at the rate of £150 per annum, plus war bonus and full residential emoluments.

Applications, together with three copies of recent testimonials, must be delivered to the MEDICAL OFFICER OF HEALTH, Town Hall, Chester, by Saturday, the 25th April, 1942. Canvassing will disqualify and relationship to members of the Council must be disclosed.

Royal Halifax Infirmary.

Applications are invited from registered medical practitioners (Male) for six months from 1st May, 1942, for CASUALTY OFFICER (A). Salary £150 per annum. R practitioners within three months of qualification may apply. The appointment includes full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to: A. MIDGLEY, Secretary.

10th April, 1942.

Essex County Council.

PUBLIC HEALTH DEPARTMENT.

Applications are invited from registered medical practitioners possessing experience of administrative work for the post of ASSISTANT MEDICAL OFFICER on the Central Staff of the Council's Public Health Department.

The duties of the officer will be chiefly to assist in the administration of hospitals, sanatoria, public assistance establishments, and the tuberculosis services of the Council.

The salary attaching to the post will be at the rate of £650 a year, rising, subject to satisfactory conduct and service, by annual increments of £25 to £700 a year, but the commencing salary may be varied, having regard to the experience and capabilities of the candidate appointed.

Forms of application may be obtained from the undersigned, to whom they should be returned completed, accompanied by copies of three recent testimonials, and in envelopes endorsed "Assistant Medical Officer," not later than 27th April, 1942.

Canvassing, whether directly or indirectly, is forbidden.

JOHN E. LIGHTBURN, Clerk of the County Council.

County Hall, Chelmsford, 30th March, 1942.

County Council of Durham.

Applications are invited for the post of TEMPORARY ASSISTANT MEDICAL OFFICER OF HEALTH (Male) at a salary of £600 per annum, plus cost-of-living bonus.

Applicants must be registered medical practitioners, and the possession of a qualification in Public Health will be an additional recommendation.

The officer appointed will work under the direction of the County Medical Officer of Health and will be required to devote the whole of his time to the duties of the office, which will include medical work associated with the County Council's Air Raid Precautions Scheme.

The appointment is subject to one calendar month's notice on either side, to the regulations for the time being of the County Council relative to the payment of salary in case of sickness, and to the provisions of the Local Government Superannuation Act, 1937. The successful candidate will be required to pass a medical examination.

Travelling and subsistence allowances will be paid by the County Council in accordance with a scale to be approved from time to time.

Applications, stating age, qualifications and experience, and accompanied by copies of not more than three recent testimonials, should be forwarded to the County Medical Officer of Health, Shire Hall, Durham, not later than first post on Saturday, 25th April, 1942.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, 2nd April, 1942.

Coventry and Warwickshire Hospital.

APPOINTMENT OF CASUALTY OFFICER (B2), HOUSE SURGEON (B2), AND HOUSE SURGEON (A).

Applications are invited from registered medical practitioners, Male and Female, for the above appointments, including, in the case of the B2 appointments, R practitioners who now hold A posts, and including R practitioners within three months of qualification for the A post. To R practitioners the appointments will be limited to six months. Salary at the rate of £150 per annum, plus £20 cost-of-living bonus, and full residential emoluments. The appointed candidates will be expected to take up duties on the 1st May, 1942.

Applications for the above posts, stating age, nationality, qualifications with dates, experience and details of previous appointments, and accompanied by copies of not more than three recent testimonials, should be addressed to the HOUSE GOVERNOR AND SECRETARY, Coventry and Warwickshire Hospital, Coventry.

East Fortune Sanatorium Unit

(220 Beds)

BANGOUR HOSPITAL, BROXBURN, WEST LOTHIAN.

ASSISTANT MEDICAL OFFICER (B1 post), Male or Female, required to take up duty at an early date. The Sanatorium deals with all forms of tuberculosis and this is the only assistant post. Salary £350, with board, lodging and laundry. Superannuation. Suitably qualified R practitioners holding B2 or B1 posts may apply, but must have obtained the prior sanction of the Scottish Central Medical War Committee.

Applications, with three copies each of three recent testimonials, should be sent on or before 22nd April, to the subscriber.

G. J. MCGREGOR, Secretary.

County Rooms, Geo. IV Bridge, Edinburgh.

East Suffolk and Ipswich Hospital,

IPSWICH (400 Beds.)

Applications are invited from registered medical practitioners for the appointment of RESIDENT SURGICAL OFFICER (B1) to this Hospital and MEDICAL SUPERINTENDENT to the branch hospital (50 Beds). Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding Diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary £500.

Applications stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to— ARTHUR GRIFFITHS, Secretary.

The Hospital, Ipswich, 11th April, 1942.

Surrey County Council.

PUBLIC HEALTH DEPARTMENT.

Applications are invited for the temporary position of RESIDENT PHYSICIAN AND ACTING DEPUTY MEDICAL SUPERINTENDENT (B1) at REDHILL COUNTY HOSPITAL (400 Beds). Suitably qualified R practitioners holding B2 or B1 appointments may apply. The salary scale is £600 per annum, rising by £25 annually to £700, plus full residential emoluments valued at £125, and an additional £50 per annum for administrative duties whilst acting as Deputy Medical Superintendent. Preference will be given to holders of a higher medical qualification. The post is temporary for the duration of the war and is terminable by one month's notice on either side.

Applications, stating age and experience, and enclosing copies of testimonials, should be sent to the County Medical Officer, County Hall, Kingston-on-Thames, by the 22nd April, 1942.

DUDLEY AUCKLAND, Clerk of the Council.

County Hall, Kingston-on-Thames, 2nd April, 1942.

The Warwickshire and Coventry

JOINT COMMITTEE FOR TUBERCULOSIS.

KING EDWARD VII MEMORIAL SANATORIUM, HERTFORD HILL, Near WARWICK.

Applications are invited from registered medical Women practitioners for the appointment of JUNIOR ASSISTANT MEDICAL OFFICER (A) at the above Sanatorium. The appointment will be for six months and may be renewed for a further period of six months. The salary is at the rate of £300 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent to the Medical Superintendent, King Edward VII Memorial Sanatorium, Hertford Hill, near Warwick, not later than 23rd April, 1942.

L. EDGAR STEPHENS, Clerk to the Joint Committee.

Shire Hall, Warwick, 27th March, 1942.

Royal Isle of Wight County Hospital,

RYDE.

Applications are invited from registered medical practitioners (Female) for the appointment of a HOUSE SURGEON (B2), to become vacant on 1st May next. The appointment will be for six months. Salary at the rate of £180 a year, with board, residence, and laundry. As this is the senior post, previous surgical experience is advisable.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

A. S. GORDON, Secretary.

City and County of Newcastle upon

TYNE.

NEWCASTLE GENERAL HOSPITAL (900 Beds).

APPOINTMENT OF HOUSE PHYSICIANS (A) AND HOUSE SURGEONS (A).

Applications are invited from registered medical practitioners for the above appointments, including R practitioners within three months of qualification. The appointments will be tenable for a period of six months. Salary £150 per annum, together with the usual residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of two recent testimonials, should be forwarded immediately to the MEDICAL OFFICER OF HEALTH, Health Department, Town Hall, Newcastle upon Tyne, 1.

Manchester Royal Eye Hospital.

Applications are invited from registered medical practitioners, Male and Female, for the appointment of a HOUSE SURGEON (A), now vacant. R practitioners within three months of qualification may apply when appointment will be held for a period of six months. Salary is at the rate of £120 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent to—

H. R. NORTH, General Superintendent and Secretary.

The King Edward VII Welsh National

MEMORIAL ASSOCIATION.

Applications are invited from registered medical practitioners, Male and Female, for the following appointment, including R practitioners who now hold A posts when appointment will be limited to six months: JUNIOR ASSISTANT RESIDENT MEDICAL OFFICER (B2) at the NORTH WALES SANATORIUM, Denbigh (247 Beds for pulmonary female patients, and surgical tuberculosis in men, women, and children, exclusive of Government pavilions—96 Beds at present in commission—for the treatment of Service cases suffering from tuberculosis). The salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent immediately to—

D. A. POWELL, Principal Medical Officer.

Memorial Offices, Cathays Park, Cardiff, 30th March, 1942.

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Preston and County of Lancaster
ROYAL INFIRMARY.

Applications are invited from registered medical practitioners, Male and Female, for the post of RESIDENT ANÆSTHETIST (B2), to become vacant on 31st May, 1942, including R practitioners who now hold A posts when appointment will be limited to six months. Preference will be given to candidates who hold the Diploma in Anæsthetics. Salary will be at the rate of £300 per annum, with the usual residential emoluments, for a practitioner holding the Diploma in Anæsthetics.

Applications, stating age, qualifications with dates, nationality, and present posts, and accompanied by copies of three recent testimonials, should be sent to—

JOHN GIBSON, Superintendent and Secretary.

Royal Infirmary, Preston.

Royal Sussex County Hospital,
BRIGHTON.

Applications are invited from registered medical practitioners (Male) for the appointment of a HOUSE SURGEON (A), vacant early in May. R practitioners within three months of qualification may apply when appointment will be for a period of six months; otherwise it will be for a period of at least six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

L. L. W. LANCASTER-GAYE, Secretary-Superintendent.

Pembroke County War Memorial
HOSPITAL, HAVERFORDWEST.
(Total 182 Beds.)

Applications are invited from registered medical practitioners for the appointment of a HOUSE SURGEON (A) to become vacant on May 1st. R practitioners within three months of qualification may apply when appointment will be for a period of six months. Salary is at the rate of £200 per annum, with full residential emoluments.

Applications, stating age, qualifications, with dates and nationality, and accompanied by three testimonials should be sent to—

B. GLANVILLE DAVIES, Secretary.

Llanelly and District General
HOSPITAL. (148 Beds plus 100 Beds, ANNEXE.)

Applications are invited from registered medical practitioners, Male or Female, for the appointment of SENIOR HOUSE-SURGEON AND ANÆSTHETIST (B2) including R practitioners who now hold A posts.

To R practitioners the appointment will be limited to six months. Salary according to experience and qualifications, with minimum of £200 per annum.

Applications, stating age, qualifications with dates, nationality, and present post, accompanied by copies of three recent testimonials, should be sent immediately to—

T. E. PIPE, Secretary.

Hull Royal Infirmary.

Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (A), vacant May. R practitioners within three months of qualification may apply, when appointment will be limited to six months. Salary at the rate of £175 (plus £25 war bonus) per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent to: R. J. CARLESS, House Governor.

The Chester Royal Infirmary.
(Normal Capacity 225 Beds.)

Applications are invited from registered medical practitioners for the appointment of a NON-RESIDENT ORTHOPÆDIC REGISTRAR (B1) to take up duty on 13th May, 1942. Applicants should have held house appointments and had experience in Orthopædics. Preference will be given to candidates holding diploma of F.R.C.S. Suitably qualified R practitioners holding B2 or B1 appointments are invited to apply. Salary is at the rate of £350 per annum, with lunch and tea and certain other professional emoluments.

Applications, stating age, nationality, qualifications with dates, experience, and details of previous appointments, and accompanied by copies of three recent testimonials, should be sent to the undersigned not later than the 25th April, from whom a copy of the Rules of the appointment may be obtained.

W. H. GRACE, Hon. Secretary, Medical Committee.

Hampshire County Council.
COUNTY COUNCIL HOSPITAL, ALTON.

Applications are invited from medical practitioners, Male or Female, for post of RESIDENT HOUSE OFFICER (A post) at £150 per annum. R practitioners within three months of qualification may apply when appointment will be for period of six months; otherwise may be extended to twelve months.

Applications, stating age, qualifications with dates and nationality, and accompanied by copies of three testimonials, to be sent to—

H. LESLIE CRONK, County Medical Officer.

The Castle, Winchester.

The Southampton Children's Hospital
AND DISPENSARY FOR WOMEN.

Applications are invited from registered medical practitioners, Female, for the appointment of a RESIDENT MEDICAL OFFICER (A), now vacant. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by three recent testimonials, should be sent immediately to: ELLA K. MATTHEWS, Secretary.

Montagu Hospital, Mexborough.
(120 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of RESIDENT CASUALTY OFFICER (B2). R practitioners who now hold A posts may apply when appointment will be limited to six months; otherwise it will be for a period of twelve months. The salary is at the rate of £250 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of three recent testimonials, should be sent immediately to—

A. LAYCOCK, Secretary-Superintendent.

Borough of Preston.
SHAROE GREEN HOSPITAL. (250 Beds.)

Applications are invited from registered practitioners for the post of ASSISTANT FEMALE RESIDENT MEDICAL OFFICER (B1). Salary £350, rising to £450 plus war bonus, with full board and residence. Previous experience in midwifery is essential, the duties consisting mainly of obstetrical work (35 Maternity Beds).

Applications, stating age, qualifications, and experience, with testimonials, to be sent by 2nd May.

H. E. NUTTER, Town Clerk.

Royal Albert Edward Infirmary
AND DISPENSARY, WIGAN. (Normally 189 Beds.)

Applications are invited from registered medical practitioners (Male) for the appointment of a HOUSE SURGEON (A), now vacant. R practitioners within three months of qualification may apply, when appointment will be for a period of six months. Salary is at the rate of £150 per annum, with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent as soon as possible to—

A. STANLEY BRUNT, General Superintendent and Secretary.

The Royal Hospital, Wolverhampton.
(Incorporated under Royal Charter.) (310 Beds.)

Applications are invited from registered medical practitioners, including R practitioners within three months of qualification, for the following post: HOUSE SURGEON (A). Duties to commence forthwith. Salary at the rate of £100 per annum, with full residential emoluments. The appointment is for six months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of three recent testimonials, should be sent immediately to—

9th April, 1942. W. H. HARPER, House Governor.

Royal West Sussex Hospital,
CHICHESTER, SUSSEX. (334 Beds.)

Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (A), including R practitioners within three months of qualification. Appointment will be for six months. Salary £120 per annum, with full residential emoluments. The post includes general work.

Applications, stating age, qualifications with dates, and nationality, together with copies of three recent testimonials, should be sent to: K. H. WILLIAMS, House Governor.

8th April, 1942.

Wanted, Locum for duration. East
End Practice.—Address, No. 862, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Applications are invited from fully
qualified medical practitioners, over military age, preferably with either industrial experience or with D.P.H. degree, for full-time appointment as MEDICAL OFFICER to a large industrial concern, engaged upon essential war work, with factories in the Greater London area. Salary £650–£800 per annum, according to qualifications.

Write, giving details of age, qualifications held, and professional experience, to "M.O.," Box 677, A.K. Advertising, 4, Talbot-mansions, Museum-street, W.C.1.

North-East Coastal Town. Receipts
averaging £3500 even in war-time. Panel 1200 approximately. Well-fitted and modern house of corresponding size.—Address, No. 860, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Old-established Practice in New Country
Village. Receipts about £1500–£1600. Panel £500. Two appointments—M.O.H. £120, Poor Law £120. Good house, £1700; garden with tennis court. Books kept up to date by bookkeeper. Willing to meet prospective purchaser more than half-way for early sale.—Address, No. 865, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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